

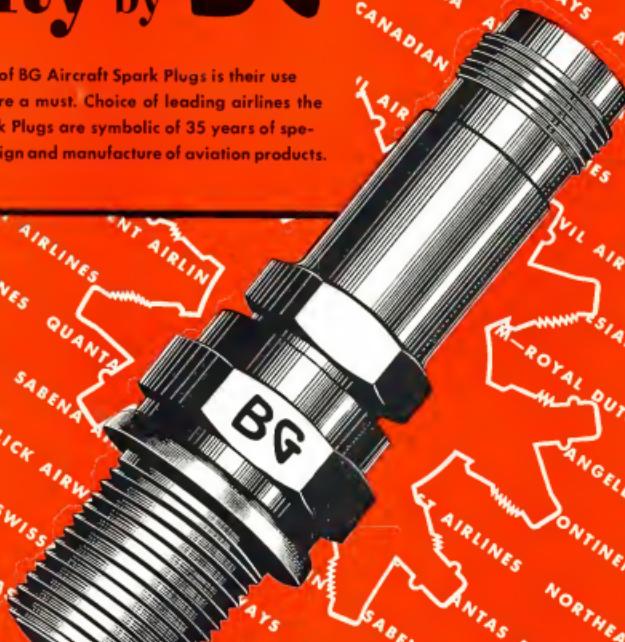
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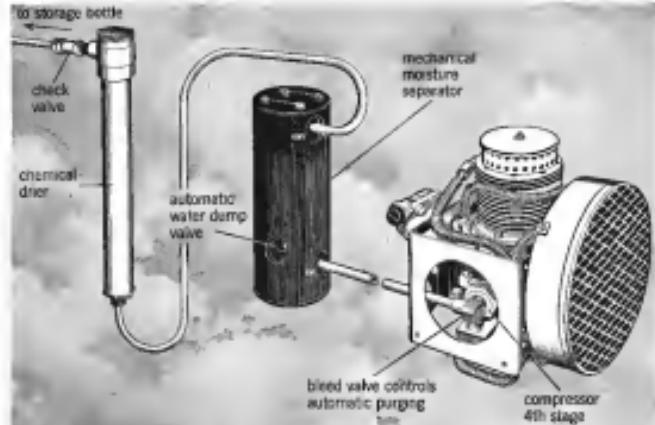
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NEWS DIGEST

Domestic

Chrysler Corp. has been awarded a ninth \$10-million-dollar contract for research and development on an Army Ordnance guided missile. The work will be handled in a portion of the \$10-million in November award given earlier this month. Donald C. George J. Hoeber, M. Chrysler chief engineer research, will be executive manager of the project.

Cessna YB-60 night jet booster made its first cross-country flight from Ft. Worth, Tex., to Edwards AFB, Calif., to undergo on route performance and engine thrust tests at the experimental base.

Alden E. Packard, head of the aerodynamics section, Hughes Aircraft Co., Culver City, Calif., has been appointed to the Research & Development Board's committee on guided missiles.

Personal and executive plane shipments by air increased during September totalled 222, up 44% from plane craft sold in \$1,005,000. There were 193 four or more-place planes and 33 one- and two-place planes.

Navy has ordered additional, urgently-needed numbers of seaplane F3H-1 Demons jet fighters from McDonnell Aircraft Corp., St. Louis, Mo.

Damage and cost assessing the in-flight collision of Eastern Air Lines DC-4 and a Bolivian P-55 fighter at Washington National Airport Nov. 1, 1959, has been ruled by U. S. Court of Appeals, Washington, D. C. Roberta 310 passengers and \$15 million in claims may be involved.

Leslie O. Barnes has resigned as director of operations for ATA and executive director of National Air Transport Coordinating Committee to become director of acquisition for Southern Air Lines. He succeeds Col. Melvin W. Rutherford as vice president and director of the carrier last summer.

San Diego city officials have been asked to refine permits for construction of multiple-story buildings in an industrial area adjoining Marine Naval Air Station, which is being developed into a large jet plane base and has a simulated aircraft carrier deck process landing and takeoff area.

Dow Flowers, former Census Aircraft Co. sales manager, has become a partner in the new firm of Colburn & Flowers,



CHARLES F. WILLIS, JR., right, confers with Sherman Adams, administrative assistant to President-elect Eisenhower, following Willis' appointment as special assistant to Adams. The two men are at Eisenhower's headquarters at the Fleet Commodity, New York City. A Navy veteran of World War II, 35-year-old Willis has served as part of a division of Wallace Corp., which was first to take on his post. He was active from September 1951 in the Clinton fleet commandant's campaign.

Financial

W. L. Marston Corp., New York City, maker of electric mechanical and electronic devices, reports sales of \$157,253,388 for the fiscal year ended Sept. 30, with net income being \$32,649. This compares with the previous year's total sales of \$77,455,985. Earnings for Dec. 15 totaled under than \$45 million compared with \$36 million a year earlier.

Lem, Inc., Grand Rapids, Mich., reports act disbursements for 1952 of \$457,350,000, compared with disbursements to date of \$212,220,000 in 1951. Shipments for each month in the last quarter of 1952 were more than \$41 million.

Intertek Engineering Corp., El Segundo, Calif., has delayed a 5-cent dividend payable Jan. 31 to shareholders as of record date Jan. 15.

International

Pearl de Brazil has purchased four DEI Comair Service 2 jet transports with delivery starting next year and has taken option on two Comair Service 3. Order value: 45 Comair definitely sold and since May 1952 more under discussion, every in advanced stages of negotiation, with another 12 involved. Airsoft Co., Ltd.

Baird & Warner Aircraft Engine Company has been named the licensee by the British Air Ministry. Civil version of the plane is known as the Universal.



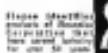
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WHO'S WHERE

In the Front Office

William R. Kivett has been president of Oldsmobile Division, Fisher Brothers, a subsidiary of Transamerica Air Lines. Other officers named to the firm's board of directors included Kirby M. Beeson, vice president; Michael R. Petrie, secretary; Francis Jones, treasurer; Bob Baker, assistant treasurer; and L. G. Bouquet, plant manager.

Charles E. McNamee has been appointed vice president in charge of engineering at Geva Corp., New York, a subsidiary of General Aviation Corp.

Changes

Edmund B. Paine has joined Air Transport, Teterboro, N. J., as factory manager of the company's new maintenance facility. E. W. Conkle has been promoted to works manager of Associated Metals, Inc., Syracuse, N. Y., manufacturer of fuselage aircraft forgings.

Charles F. McKenna has been named supervisor of the Aerostatic Main Landing Gear Division of F. G. Goddard Co., Akron, Ohio.

W. E. Bryant has been designated Northeast Airlines director of ground safety, a new position.

W. L. Van Dorn has been appointed director of engineering in the Bell Aircraft Division, Wichita, Kan. He formerly was supervisor of master scheduling at Convair, San Diego.

John C. Baskin has been elected senior vice corporate treasurer of Southwest Airlines Co., Dallas, Tex. George Howell, Jr., has been named works manager of Lockheed, Inc., Binghamton, N. Y.

Seneca Heating recently was named part-time engineer for helicopter research at Convair Aircraft Co., Webster, Kan.

Robert F. Brinkley has been appointed assistant controller and traffic manager for National Airlines, Inc., Atlanta.

Capt. E. C. Kelly Rogers has been promoted to deputy project manager of Air League Miss America Show II and is now second group manager of the Jet Attack.

W. E. Clark has been appointed vice president and chief financial officer of Braniff International Co., Grand Prairie, Texas.

Donald E. Flanigan has been appointed sales manager of United Aircraft Products, Dayton, Ohio.

Bob E. Ray has joined International Civil Aviation Organization as director of the legal bureau, Montreal.

William C. Kress has been designated executive engineer of Vapor Heating Corp., manufacturers of thermostats for military aircraft.

Honors and Elections

Bog. Gen. John P. Blodgett, president of Stratovar Aviation Management Corp., has been named by U. S. Major Cluster of Command as one of the "10 outstanding young men in the United States."

INDUSTRY OBSERVER

► Watch for changes to appear soon as experimental propeller material Engineers of three leading propeller companies are working on titanium blade designs.

► Veterans Safety pilots in Korea were pleased to see North American Aviation engineers eliminate considerable weight and complexity from the F-86 by eliminating the semi-intrusive leading edge wing slats and improving leading edge characteristics of the wing. First of the new wings has appeared in specially modified F-86s and will be standard on F-100s now beginning to roll off the North American production line.

► Army is interested in the development of new-type cargo helicopters and has asked for special research and development funds in its 1954 budget to back the project.

► Major interest to development of systems safety for aircraft use for training and storm warning is the lack of a suitable strength-to-weight ratio. Engineers developing Avionics Radio Inc. safety specifications say newly developed storm tubes offer the only means of obtaining a sufficiently light cockpit display that pilots could read easily at daylight. However, Hughes Aircraft and RCA reportedly are not too interested in this application of their new storm tube because of the priority of military applications.

► The Douglas Convair 5 may be the last of the Convair series. The plane now referred to as the Convair 4 will incorporate such radical design changes from the present Convair series that the Douglas probably will give it a new name. Although no firm name has yet been fixed for the Convair 4, it is markedly different weight for higher Mach number is in prospect.

► Protagonists search for the principle difficulties with the current version of the Vought Supermarine Swift involve wing flutter and control problems at high speeds.

► Anglo-American conferences on reentry coefficients of jet transports are expected to begin in Washington early in February. Robert Herring, later, secretary of the British Air Registration Board, and his technical staff are scheduled to leave London for Paris for conference with CAA Administrator Charles Horne and his technical staff, headed by George Holdstock.

► USAF neglect of the supersonic propeller flight-test program is reflected by the fact the turbojet-powered Republic F-84H is not expected to take to the air until mid-1954. The F-84H will be powered by a Wright T-34H turboprop having an Avro ordnance of two three-bladed, anti-diamond, high-speed propellers mounted in tandem.

► Vought orders for reengining Valiant bombers will include some tanked versions for aerial refueling operations. British have developed new types of probe/tank probes to fit the high subsonic speeds of its new trio of jet bombers—Valiant, Vulcan and Victor.

► Armstrong's answer to the Curtiss criterion method of testing propellers is expected to be a new Ajar stiff machine to be installed at Weybridge, England. The Ajar will produce findings to considerably closer tolerance than the former Ringing method previously used, but indications are that Armstrong will use a two-blade blade.

► Navy plans to enjoy a large number of its combat units with guided missiles during 1953. Standard diameter missile will be the Sparrow, scheduled to go into volume production at a new plant located at Bristol, Tenn. Chance-Vought also has a large Navy production order for its Regulus ground-to-ground missile. Regulus is a pulse-jet aircraft type missile powered by a turboprop, similar to the USAF Minuteman built by the Glenn L. Martin Co.

Record Postwar Air Spending Predicted

- Budget estimates a peak of \$21 billion in 1954.
- AF expected to complete bulk of 143 wings.

By Robert Hora

Federal spending on aviation is headed for a record postwar peak of \$21 billion during fiscal 1954, according to budget estimates submitted to Congress by President Truman.

The \$21 billion in aviation expenditures estimated for fiscal 1954 compares with flat spending of an estimated \$19 billion for the current fiscal year ending June 30.

New funds requested for aviation in the Truman budget ask about 37 billion less than last year—\$27 billion for fiscal 1953 and \$30.7 billion for fiscal 1954. New obligations for aviation account for about 27% of the total \$72.9 billion federal budget requested for fiscal 1954. These budget requests face a tough fight in the 83rd Congress, where the Republicans majority is bent on cutting administrative costs.

Budget totals of aviation expenditures and new obligations fall in the Air Force, which accounts for 50% of the spending and 71% of the new obligations.

Purchases. Purchases of aircraft of slightly more than 50 billion has been projected to have 5,500 new aircraft and related equipment. USAF will add about 3,900 of these planes, with the remainder divided among Navy, Marine and Army aviation.

During fiscal 1954, USAF and Navy together plan to spend 50 billion on aircraft procurement compared with an estimated 37 billion expended in fiscal 1953. No figures are available on Army aviation spending for either fiscal 1953 or 1954.

With the fiscal 1954 aircraft procurement requests, the purchase of a total of 50,000 new military aircraft will have been provided for since the outbreak of war in Korea at the end of fiscal 1950.

The fiscal 1954 procurement budget will complete the bulk of USAF procurement for the 143 wings program, bearing unexpected requirements of obsolescence and attrition. It also will provide for reconditioning of 16 Navy Air groups plus supporting units and three Marine air wings and greatly ex-

Funds for Air Power			
Money Requested			
	1952 FISCAL (ACTUAL)	1953 FISCAL (ESTIMATED)	1954 FISCAL (ESTIMATED)
Air Force	\$22,976,000,177	\$23,370,115,779	\$16,781,000,000
Navy Aviation	\$2,048,239,000	4,077,042,300	3,189,176,000
Army Aviation	118,173,704	115,118,124	221,574,194
(includes aircraft procurement and air defense research and development)			
TOTAL	\$18,134,246,105	\$27,341,316,975	\$10,910,872,184

Spending Planned			
Air Force			
	1952 FISCAL (ACTUAL)	1953 FISCAL (ESTIMATED)	1954 FISCAL (ESTIMATED)
Air Force	\$11,194,670,774	\$11,512,060,000	\$17,470,000,000
Navy Aviation	2,181,257,576	2,500,000,000	2,046,000,000
TOTAL	\$14,775,926,350	\$13,012,060,000	\$19,516,000,000

Aircraft and Related Procurement

Money Requested			
	1952 FISCAL (ACTUAL)	1953 FISCAL (ESTIMATED)	1954 FISCAL (ESTIMATED)
Air Force	\$11,023,601,212	\$12,511,902,000	\$16,460,000,000
Navy Aviation	9,110,000,000	3,930,000,000	3,716,154,000
Army	96,998,512	72,067,315	11,893,2,315
TOTAL	\$16,136,599,415	\$16,607,041,315	\$19,810,000,000

Spending Planned			
Air Force			
	1952 FISCAL (ACTUAL)	1953 FISCAL (ESTIMATED)	1954 FISCAL (ESTIMATED)
Air Force	\$4,366,897,198	\$6,800,000,000	\$1,000,000,000
Navy Aviation	1,346,712,340	3,614,000,000	2,800,000,000
TOTAL	\$5,713,609,538	\$7,814,000,000	\$10,800,000,000

planned Army aviation, particularly its helicopter units.

The largest provision in the fiscal 1954 Defense Department budget for financing the Korean war after June 30, 1953, if the war continues beyond that date, a supplemental appropriation will be necessary to finance it.

By the end of fiscal 1953, the annual forces totals will have an active inventory of 37,000 aircraft, 21,000 in the Air Force, 13,000 in the Navy and Marines and 3,000 in the Army.

Here are the aviation highlights of the fiscal 1954 budget requests by agency:

Air Force

The Air Force again got the lion's share of the Defense Department budget with an impact for \$16.8 billion of the department's \$41.5 billion total. This compares with \$22.3 billion in

fiscal 1953 and \$12.9 billion for fiscal 1952. It is about four times the Truman 1950 budget of \$4.6 billion.

Procurement of aircraft, parts and other materials, USAF expects to have 100 combat wings activated by next June 30 and 153 wings scheduled for service by June 1954. This program would lose USAF 10 combat wings short of its 143-wing goal.

Operations Increased. The larger combat forces available in fiscal 1954 necessitate an increase in maintenance and operations funds from \$16,500 million for fiscal 1953 to \$14,253 million for fiscal 1954. This fund is allocated in following:

• Operations of about \$13,321 million. Includes procurement of spare parts, parts, gas, oil and other aerial supplies; and maintenance of aircraft, aircraft support to support the flying base program of the regular Air Force and Air National Guard.

• Logistics support—\$10,254,250,000. Provides for depot maintenance of all aircraft in the regular inventory, operational USAF depot supply support and commercial aircraft transportation which is required to distribute USAF supplies.

• Training support—\$239 million. Provides for an increase in pilot training from the annual rate of 18,000 scheduled to be observed by the end of fiscal 1953 to a rate of 32,000 a year for fiscal 1954. Increased training rates also will increase.

• Operational support—\$464,130,000. Provides for maintenance and operation of aircraft and facilities required by USAF commands to fulfill their combat mission, operation of air warning and fighter control network, etc. Active operational support established in fiscal 1954 was set at 320, an increase of 44 over the 271 programmed in 1953.

• Research and test support—\$90 million. Provides for operation of USAF facilities and installations supporting the research and development programs. This includes missile launching bases, electronic and assessment hot rooms, and aircraft test and development centers.

• Reserve. Doublets—USAF plans to more than double its reserve force in 1954, increasing from 14,589 airmen and men to 30,000 in a total of 32,000 for 1954.

The total includes 3,631 pilots and navigators, Air National Guard will retain its present strength of 37 now but wings plus supporting units in 1954, as the last units are retained from federal service to state jurisdiction. A total of 22 ANC combat wings will return from active duty during 1953. The AF ROTC program will be expanded for expansion of all wings and maintenance services during 1954 with a peak enrollment of 17,700 and an annual crop of 18,000 new USAF reserve officers.

The tank construction item in the Defense Department budget is the \$700 million allocated for building USAF bases overseas.

Navy

The Navy and Marine Corps plan no increase in the 16 carrier air groups and 100 combat wings in 1954.

• Combat. Guided Missiles—Navy has allocated \$21,847,500 to begin activating this year a large number of missiles to be used in the Transoceanic Corps. AF will spend a substantial part of its \$13,276,653,000 procurement and guided missile request for strategic bombers.

A \$2,416,000 fund requested for industrial mobilization will be devoted primarily to development of new types of cargo helicopters. Another fund of \$70,000,000 for defense

Proposed Air Power Allocations for 1954

Under President Truman's proposed budget, this is how the services plan to obligate funds in selected aviation categories in the 1954 fiscal year, compared with previous years. Figures reflect both actual expenditures and obligations incurred through new contracts.

Air Force

1952 Fiscal (Actual)
1953 Fiscal (Estimated)
1954 Fiscal (Proposed by the President)

Aviation parts, equipment procurement	\$19,411,587,318	\$11,464,387,462	\$6,161,510,000
Guided missile procurement	97,643,531,452	105,347,863	\$17,300,000
Industrial mobilization	3,703,710	16,874,300	5,000,000
Other procurement and equipment procurement			
Training equipment procurement	161,591,758	87,368,351	47,000,000
Construction, U.S.	1,006,598,756	1,056,573,706	1,056,573,706
Construction, overseas	149,684,204	98,579,706	1,026,562,000
Research and development	435,562,190	97,197,000	28,311,000
(a) Aircraft	34,691,204	11,200,441	11,200,441
(b) Guided missiles	113,631,704	33,170,441	10,750,000
(c) Propulsion	16,839,208	91,164,396	112,315,000
(d) Avionics	13,610,704	13,706,156	76,150,000
(e) Armament	30,399,942	32,125,856	49,705,000
(f) Equipment	23,494,204	4,494,186	38,115,000
(g) Research	40,572,190	47,137,000	57,500,000
(h) Special aircraft	18,306,178	36,475,373	13,764,000
(i) Mobility equipment	8,459,191	6,379,461	6,379,461

Naval Aviation

Aviation parts, equipment procurement	\$1,784,406,697	\$7,359,572,346	\$1,160,341,000
Aviation ordnance procurement	72,106,760	19,000,000	195,556,000
Guided missile and cargo drone procurement	52,146,588	161,100,000	173,150,000
Industrial mobilization	18,720,750	6,483,000	7,454,000
Other procurement procurement	25,420,000	36,314,000	63,970,000
Research and development	167,117,311	161,966,000	190,000,000
Industrial mobilization	8,470,994	8,401,000	2,416,000

Army Aviation

Aviation procurement	\$8,997,735	\$11,267,313	\$18,002,817
Electronics and communications equipment	18,441,321	210,463,129	229,637,000
Ammunition and guided missile procurement	2,161,846,941	3,907,286,199	1,179,655,490
Research and development (air research and development)	59,115,531	61,975,490	70,018,307

Army

The Army more than doubled its aircraft procurement impact for fiscal 1954 with \$198,903,935 compared to \$76,647,015 for fiscal 1953. Much of the new funds will be devoted to purchase of large craft believed to be required by the Transportation Corps. AF will spend a substantial part of its \$13,276,653,000 procurement and guided missile request for strategic bombers.

Army has requested \$16,535,903 for the first part of the program. The Air Force allocation is in addition to \$72,178,000 intended for guided missile procurement.

A \$2,416,000 fund requested for industrial mobilization will be devoted primarily to development of new types of cargo helicopters. Another fund of \$70,000,000 for defense

Robert Hunter and the F-104 Mystery fighter.

An \$85 million order for the Mydas is reported almost ready for approval by officials of the U.S. off-shore procurement program. An announcement of a multi contract for the Hunter supersonic jet interceptor is expected within a month.

Saturation of the Hunter for the Supersonic Swift or the off-shore purchase program is "psychically dead," MSA says.

A decision to change from the Swift to the Hunter is being pursued on behalf of the two major contractors in terms of American exports.

Swift Fails—The Swift was known to have faults that could not be corrected for an MSA contract when it first was considered for NATO operation by USAF members. British and US experts believed the faults could be corrected without expenditure of large sums, important structural changes in the jet aircraft or long delays of production. But the American evaluation team report indicated the changes would be more extensive than was expected.

US officials believe production of the Hunter can be boosted once quality is met. The Swift with only delivery of finished Hunters to European NATO forces.

A June 1955 deadline imposed by the US Congress for delivery of all off-shore purchases is not the main cause for the switch from the Swift to the Hunter, officials here say. An MSA order will not be completed by either Victoria or Hunter to meet the deadline.

But prospects that Hunter production could increase rapidly gives the plane a great advantage in evaluation by American officials who are concerned about putting modern fighters into operations at the earliest possible date.

Excess Rail Rates On Plane Parts Cited

John DeWitt G. Remond, president of Aircraft Industries Assn., says the Interstate Commerce Commission could save American taxpayers millions of dollars by reducing "excessive" rates for rail shipment of aircraft parts.

The railroad industry charges that ICC was wrong in its judgment that railroads were overcharging for shipping aircraft parts. The railroads say they have been much per ton and 15 times more per ton in hauling aircraft parts than by other carriers.

"Establishment of rate exemption for those charged for transportation of other goods would result in savings of millions of dollars," Remond says, "and route to the aircraft industry but to the Defense Department and to the taxpayer."



Robert Lovett

Lovett Says Defense Not Geared for War

Secretary of Defense Robert Lovett said Congress is in a position to encourage the Defense Department to make a search for an outstanding operator or role in a strategic breakdown of its machinery to the extent of war.

Lovett recommended that the Secretary should give more effective control over air force armed forces. To complete this, he should be allowed a military staff responsible only to him.

Dollar Control—The Secretary now largely exercises control over the service "through the budget process," Lovett said, "the dollar being the single common denominator of all requirements."

"In the event of war, the dollar control will become especially weak," he warned. "The Secretary of Defense would... feel himself unable to handle the distribution of shortages in an efficient and decent fashion. It would as thus circumstances become necessary, I believe, to undertake a reorganization which would not only seriously disrupt the effective protection of the war but which could not even start until the necessary authority was secured from the Congress."

"We should not deliberately nominate a Department of Defense which would not be able to handle such a situation," he said. "This reorganization can be made in an orderly fashion under the present workload without too much difficulty."

Lovett pointed:
• That the Joint Chiefs of Staff be given a strategic planning body. To accomplish this, he suggested that the Chief delegate them greater command functions to the Vice Chiefs of Staff so that the JCS is composed of senior officers having no command post.

- That MacArthur Board be abolished and authority over military production and procurement be transferred to the Secretary of Defense.
- That a thorough study of the internal organization of the three services be made to determine if they are functionally effective.

Big Fly-By

- Military air show is set for inaugural parade.
- B-47 squadrons will make first public appearance.

A US military air parade of 400 planes and helicopters will fly above the Washington inaugural parade route of President Dwight D. Eisenhower, Jan. 20, as a combined effort of Air Force, Navy and Marine aerial units.

Meanwhile, CIA warned civilian pilots to stay outside a 50-mile radius of the city during the same period, 11 a.m. to 5 p.m. Pilots were asked to keep their altitude below 4,000 ft and to maintain a speed of 400 mph or less with Washington Airport tower for traffic control information.

United Control—The military planes, under unified control of a special Air Force Control Team from Air Proving Ground Command, will fly in sheet 2,000-2,500 ft.

Pilot plans call for cancellation of the annual winter weather maneuvers drop below a 3,000-ft ceiling and no altitude visibility.

The largest formation of big transport aircraft ever seen in this country, 25 Air Alaskan Sikorsky H-19s and 50 Marine Sikorsky HR55 coaches, will be an early feature of the parade along with 32 Air Force, Navy and Marine jet fighters, the first B-47 jet bombers, aqua parade formation and many other types.

Type Lured—The complete air parade by regional flocks.

Army-Six—Cessna LO-126 cargo-plane pilot, 12 Convair L-19 Bird Dog liaison planes, 25 Sikorsky H-34 helicopters, and 5 Hiller H-23 three-bladed transports.

Military-24—Gannons P-51 straight-wing, P-51B jet fighters, 4 Douglas F4D Skyraylets, 10 night fighters, and 30 Sikorsky H-34A helicopter assault.

Army-20—McDonnell F3H-2 Demon jet fighters, 6 Grumman F-106 interceptors, 6 North American AJ-1 Savage attack bombers, and 20 Lockheed F2V Neptunes, patrol bombers.

Air Force-10—Republic F-84E and F-84G Thunderjets, 60 North American F-86 Sabres, 32 Lockheed F-94

Stingers jet interceptors, 6 North American F-4C jet fighter, Grumman light bombers, 12 Boeing B-47 strategic bombers, Strategic bombers, 24 Fairchild C-119 Flying Boxcars and cargo planes, 12 Douglas C-124 Globemaster double-deck four-engine transports, 24 Boeing B-52 Superfortresses, 24 Boeing B-57 Superfortresses, 24 Convair B-36 intercontinental bombers.

To handle the special problems in the aerial review, the planes are being brought to local airports or to landing areas near San Francisco, New Mexico and Florida.

Planes are scheduled to assemble at closely spaced intervals over Chanticleer Beach, Md., 40 mi from Wash-

ington. They will fly over the Capital along Pennsylvania Ave. and the White House and then west to Hanover, Va., to disperse.

A communications control point is being set up atop the Stradell Building, just east of the Capitol, and two landing bases have been built for guidance of the serial parade.

Safety Guarded—L. E. Blatzoff, Jr., president, American Owners and Pilots Assn., and Middle America Chapter, has written a letter to CAA asking the agency to make sure that the flight of the serial parade is "perfect" in safety.

Pentagon spokesman said that numerous precautions were being taken to prevent accident en route.

Air Force spokesman did not review the fourth November F-104 crash, in which the plane went down in the Pacific Ocean off Kauai, Hawaii.

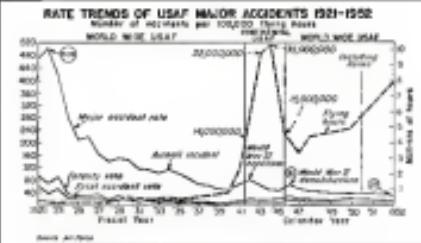
Gen. Hoyt S. Vandenberg told the congressional magazine that it is "more dangerous" for a serviceman to travel as a passenger than in a military plane. He stressed was replying to a suggestion from Rep. Paul G. Gruening that USAF should restrict AF flight training in private Chautaukaua Dunes State Park until the committee would be satisfied.

The Round-Offer—Air Force and civilian officials who were killed in USAF crashes in 1952, were also half were

in the last two years, there have been a total of 657 passengers killed in all USAF plane accidents, world wide.

• Total plane enroute by USAF in 1952 was estimated at 2 billion.

• Approximately 95% of USAF accidents are attributable to pilot error.



Aviation Safety

L-F Range Blamed in AF Crashes

By Alexander McWhorter

Civil Aeronautics Administration has agreed to replace low-frequency radio masts in Alaska, which have blown partly or entirely apart for navigation systems covering November 1952 of two Fairchild C-119 cargo carrier planes, the Air Force testbed last week before the House Armed Services Committee.

Precipitation static in bad weather on the low-frequency range signals was blamed for the mast breakage, which has been a major problem in Alaska, according to CAA spokesman James R. McWhorter. The systems are 100-150 miles apart on the corner masts and have the same feed coil wires. Brig. Gen. Richard O'Kearney, USAF director of flight safety research, told the House Armed Services Committee.

CIA C-119 pilot was qualified. His primary course 30 mi north of course en route from Elmendorf AFB to Kodiak when his plane crashed.

Falsie Course—The false course of the plane was tracked on an Air Defense Command surveillance radar, but the plane disappeared from the scope before

engines. They will fly over the Capital above Pennsylvania Ave. and the White House and then west to Hanover, Va., to disperse.

A communications control point is being set up atop the Stradell Building, just east of the Capitol, and two landing bases have been built for guidance of the serial parade.

More Crashes

With the House Armed Services Committee investigating military air crashes in Alaska, the Senate, there are three additional accidents under investigation:

• Two Jackie French C-47 crashed in emergency landing at Raleigh-Durham (N. C.) Airport in late and fog en route from Stewart AFB, N. Y., to Donaldson AFB, S. C. Three were killed.

• Jan. 7—An Army-owned C-46 carrying 17 Korean veterans en route from Seattle to Scottsboro, Tenn., crashed in the mountains near Rock Springs, Wyo.; 40 killed, including nine of 11 crew members.

• Jan. 6—Two B-56 Superfortresses of 60th Bomb Sq., Hunter AFB, Ga., collided in the air. One crashed in a marsh. The other returned with damaged tail section to land safely at the air base. Five killed.

• Jan. 6—USAF B-56 crashed near Charlottesville, Va., en route from Bolling AFB to Dallas. Pilot reported heavy icing conditions just before crash. Three killed.

New Planes In This Week's News

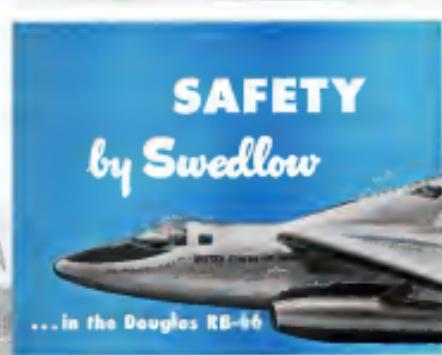


CESSNA 310 STARTS TESTS—Above: first flight photo of new Cessna 310 Super executive transport which flew its first test Jan. 1. All-metal plane has less than 215 hp. Constant-speed propellers have constant-speed feathering prop.



CESSNA 310 CLOSEUP—Prominent feature of the new 310 is the integral winglet which contains all the plane's fuel, a cutaway safety door breacher. Internal radio antenna is also used. Flies tops 36 hr. 2 min., length is 27 ft. 2 in. and height is 13 ft. 2 in.

NEW FRENCH TRANSPORT STYLÉ—New Bleu d'Alouette HLD-32 two-engine transport (below) is shown prior to flight next to its smaller predecessor HLD-10. HLD-32 will fly high speed ratio—20:1—ring. Spans at 147 ft. Engines are two 100-hp Wright CT7B1s.



The Douglas Aircraft Company's RB-66 is the twin-jet, overwing photo-reconnaissance plane developed for the U.S. Air Force, based on the U.S. Navy A3D attack aircraft. The RB-66 is rated in the 600-700 MPH class and is one of the fastest, most versatile machines of its type yet developed. Swedlow contributes to its safety, performance and efficient operation in developing its superior laminated fiberglass basking for fuel cells. The Swedlow facilities bring to the production lines of American industry 10 years of specialized experience in precision engineering and production of acrylic and laminated fiberglass parts.

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AERONAUTICAL ENGINEERING



BANSHEE wings are folded for carrier storage. Note that flaps are not reversed for folding. Grumman further folds its wings in a semi-inboard position, except that tips do not come together as in the Corsair. In the Panther, they point outward at about a 10-degree angle.

Wing Folding, Then and Now:



GANNET uses double bend in the wing panel, combining the two planes of direct overhead fold with spanwise.

D. H. 10, an early bomber design with semi-spanwiseability, hinged both upper and lower planes at a single starboard joint.



CORSAIR hangs its panels up and over almost to the point of wingtip contact.

MOTHLIKE Maubeusson is French design at vintage 1912. Note squat



CUTLASS follows through with the one-hand fold, the Vought idea. Vertical tail and 1/2-drag gear placement dictate inboard position of fold line and result in loss of tail area folded. Note extended leading-edge slats and fine details of hinge joint and folding gear.

An Aviation Week Picture Story

Wing folding is a design refinement found only in the development of the jet. But within recent memory, it has become the bane of naval airplane designs.

The requirement is set by carrier deck rates and hangar dock dimensions, and the designer's job begins there.

The industry has produced an interesting variety of methods for folding the panels. The de Havilland 10 and sister-side Macchi-Macchi show how it used to be done. More recent examples are the straight-ahead overhead fold of the McDonnell Banshee and the Wright Corsair, and the enclosed hinge-in fold of the Fairey Flycatcher and Grumman Hellcat.



HELLCAT folding by outwards developed by Kelly Johnson with paperclip and string (according to legend) and was outlined long ago in comic strip. In folding, wing drops down and aft, and leading edge is moved sharply past the ground. Models of the Wildcat and of Brewster and the Hellcat.



FIREFLY folds with an in-board hinge at the wing root. Leading edge of the wing remains low enough clearance of folding edge would be a headache with the system.

Lift Raiser

- Boundary layer control studied in Cessna 309.
- System shortens ground takeoff, landing runs.

Engineers are taking a closer look at boundary layer control for easier takeoff and landing problems of high speed planes. A cooperative program sponsored by the Office of Naval Research and carried out by the University of Wright and the Cessna Aircraft Co. indicates the possibility of shorter ground runs, increased payload and lower safety.

The project encompasses describing streamlining methods available prior to publication of additional 14 CFR Part 23.

German Data—The University of Weimar originally got a contract from GNGR in January 1949, to study the problem of Interceptor Eight Navy, was interested in the success of its operation of jets from carriers.

One of the first tasks is that program was to evaluate the German material on the subject brought to that country at the end of the war. Much work had been done by the Germans to achieve high lift, with particular emphasis on boundary layer control. That the rest of the war progressed. First tests of the Arado 232, first plane featuring the boundary layer control problem.

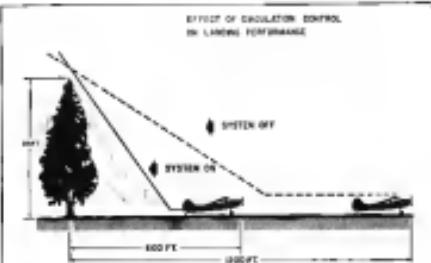
Cessna Test Plane—A personnel was made in all the flight-test gap in the German work. In January 1951, GNGR contracted with Cessna to modify their Model 170 to accommodate a broadened type control system. This plane was given the designation Model 309.

Primary purpose of the study with the boundary layer control installation was to investigate the wing aerodynamic and flight characteristics of a plane operating at lift coefficients between 1.5 and 4.0.

The arrangement on the converted plane consisted of a "leading" flap along the leading portion of the wing and a "bowing" flap along the trailing portion. Air, drawn into a slot which is formed as the flap is deflected, is then blown outward by a pumping arrangement and is finally ejected above and ahead of a single slotted flap along the upper portion of the wing span.

A section of the bowing flap is differentially controlled so as to deflect it slightly less than the remainder of the flap area.

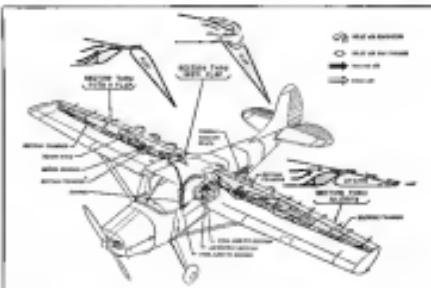
► What All Does Action of the air flowing in the suction slot prevent turbulent separation on the upper sur-



BOUNDARY LAYER CONTROL, installed in Cessna 309 allows sharp angle lift-off on flat landing by cutting in half runways length needed by uncontrolled aircraft.



TEST PLANE used to verify predicted high-lift performance of blowing flap gear.



BREAKDOWN of system used to keep flow of air smooth over wing of low speeds



Eight AERO COMMANDERS are rolling from the

production line of the factory of the Aero Design and Engineering Company each month. First airplane of its category to be built and delivered to a civilian market since World War II, 31 of these new high-performance executive transports already have gone to

work in the service of some of the leading business

firms of the country.



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use of the suction flap, with an increase of suction pressure lift coefficient of as much as 1.9.

Similarly, as blown over the dotted flap edges the boundary layer and causes separation in the upper surface of the blowing flap all the way to the trailing edge, with a similar increase in maximum lift coefficient.

The added increment of the blowing air, as it is directed downstream, adds to overall effectiveness.

► **Pump Arrangement**—For the propeller drive in the wing, characteristics of Whittle engines are such that a pump is not for a jet engine using hot gases. An airframe jet turbine compressor, similar to those used as starters for jet craft, provided the pump air supply.

"But air was brought to about 1,400°F by burning fuel between the turbine and the pump," Coxon reports. But the pump operated at a very low efficiency.

Weight of the turbine and all its essential plus allowance for plant, fuel and flight test instrumentation, brought the plane to a normal gross for the commercial version of the Model 170.

► **Flight Results**—First flight of the converted plane verified the highly favorable results for the wing and indicated that no unusual flight characteristics were present.

Coxon says shifts were required in character and increased 15 mph. down tail with the converted plane wing full flaps. Lateral control was rate factor only with ailerons in a 30-degree deflected position.

The comparative data both the modified plane and a standard 170 were used in various takeoffs and landings.

Some 40% saving in total ground run was noted with the converted plane compared with that with the standard model. Complete stops after landing took 10% less distance. At the same length of the approach and level flight with wire rods only a few feet above the ground at an indicated airspeed of 49 mph—about 11 mph slower than the stall speed of the commercial plane. Power required for level flight at this very low speed was about 10% of normal installed power.

► **Using Roley Redundant**—Other advances have obtained emphasize the potential of the boundary layer control system for takeoff and landing.

Coxon reports that one of the most significant recent concern is the lift coefficient relationship with lift coefficients of 1.7 to 1.9. Most aircraft which take off with flap tips are located at variable flap deflections due to the rapid divergence resulting from large flap deflections and the induced drag.

This drag rise, which increases as the spanwise location of the lift coefficient, is greatly reduced by the boundary layer control system, Coxon claims, and increase lift coefficient.

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leading can be made at lift coefficients of 1.0, with annual improvement in angle of climb. The exact nature of this experience has not been determined, but research is underway to uncover the factors underlying the cost savings.

► **New Pump Scheme**—The pump system used in the modified model is not entirely satisfactory because of its weight. Current plans, but designs of other pumping methods will be flight tested soon.

Ten drift indicates the possibility of using an airfoil with a high-speed trailing edge flap. One possible variation, Cessna reports, would utilize compressed air from the turbine for driving very fast trailing flow fans to pump the air on the wings.

Calculations have shown that a considerable reduction in jet thrust can be tolerated and improved lift-off and climb still obtained from increased wing lift.

NACA Reports

► **Effect of a Finite Trailing Edge Thickness on the Drag of Ribs and Delta Wings at Supersonic Speeds**—By E. R. Klasson and Conrad Reinhold, Jr.

Capping off the trailing edge of a diamond-shaped airfoil reduces the pressure drag under some conditions of supersonic flight, says the NACA in this recent report.

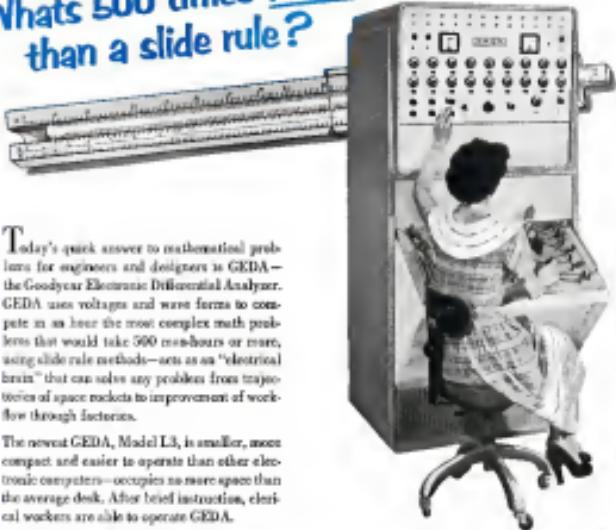
It works this way: Theory shows that for certain conditions of flight, airfoil profiles for minimum pressure drag at supersonic speeds have lowest trailing edge. The effect of this kind of trailing edge is to induce the pressure drag over the forward portion of the airfoil by diminishing the average shock-wave strength at the aft surface.

At the same time, base pressure drag is increased because of the addition of the blunt trailing edge. However, base pressure drag decreases with increases in Mach number. So there is a point where drag minimum is around half-wave and where the critical case above it is around where the blunt trailing edge pays off.

Previous NACA investigation of this aspect of drag have been applied to transonic aircraft. But in this technical note the NACA considers a practical application of the idea to the low-aspect-ratio wings of rectangular and delta layout, which are the favored supersonic shapes.

The authors used laminar theory to compute surface pressures. They considered the truncated diamond-shaped airfoil because it gives minimum drag for a given thickness ratio. Then they computed the drag of these wings

What's 500 times faster than a slide rule?



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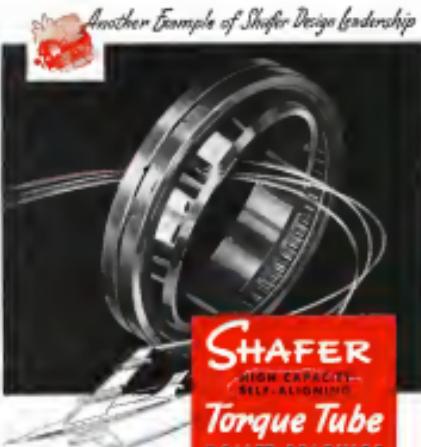
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The increasing and more production of advanced types of aircraft bearings. Here, for example, is a recent addition to the expanding family of Shafer "Mach" self-aligning torque tube roller bearings. This new type, like the one shown, has a positive self-aligning feature of surfaces and proper alignment whelching maximum deflection during flight. It is bearing-housed and contains no rolling elements. The housing itself also provides efficient sealing against contamination. (Left AF, Shafer Aircraft Division, Bucyrus R. Co., Inc.) The new "Mach" bearing has a combination of low weight and top quality with unexcelled capacities of greater service, dependability and performance and long life. Write for catalog. Shafer. Write for details—and remember.

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with their more-concentrated approachs with sharp trailing edges. And that would cut the airways for several modifications in aspect ratio and thickness ratios and Mach numbers from 2 to 5.

The reverse point—where the drag saving begins to show—depends on the wing planform, aspect ratio and thick/skin ratio. If you choose Mach number and aspect ratio, then the drag savings are greater with the thicker sections.

With rectangular wings, aspect ratio produces little effect in drag, nor in the defining geometry; aspect ratio effects are about equal to thickness of front in reducing drag.

One parameter used by the authors in calculating the drag effects is the ratio of maximum drag coefficients for the blunt wing and the sharp-edged wing. This ratio decreases with decreasing aspect ratio.

The authors also note that, though they confined their work to delta and rectangular wings, these may argue that the scheme will work out for other platforms as well.

► A Special Investigation to Develop a General Method for Thermophysical Photoelastic Stress Analysis (TPI 2522) —By M. M. Frost and R. Gossman, Jr.

Material treatments more representative results from the "scatter stress" approach to photoelastic studies in the country, says this report. NAGFA tech rep. note.

In the "fraying" technique plastic specimens are loaded while in a jig. The loaded piece is then annealed. After cooling, the test piece is removed from the jig and dried at a temperature which we polished to a fine finish. The surface "freezes" stress and strain in the specimen.

D disagreeing slightly with the results of French researchers reported earlier in *Aeronaut. Week* (Jan. 12, p. 34), the authors point out that success of the "frozen stress" technique depends on the availability of materials with a low value of Poisson's ratio at elevated temperatures. (Poisson's ratio defines the ratio of lateral and transverse to linear strain deformation in test specimens loaded slowly.)

The newest approaches to such materials are Fomatec and Bokalite which have stress values of about one-half. But the "frozen stress" method breaks down as the Fomatec resin approaches a value of one-half.

This report notes a method developed by the authors which does not depend on Poisson's ratio, and can therefore be used with Fomatec and Bokalite materials. It uses the "frozen stress" technique but differs from the British approach in the method that is used in determining stresses.

PRODUCTION



DRAG PILES for Keweenaw 35,000- and 21,000-ton clamshell drag piles covers more than an acre and is seven stories deep

Planting of AF's Press Giants Begins

These massive heavyweights, with individual parts weighing as much as 100 tons, need special leads.

By Irving Stone

Aircraft isn't the only thing that we're thinking these days. The huge machines and their special aerodynamics are being created within the Air Force's heavy press program, never mentioned in the aviation field. So massive are these presses that major construction projects will be required to build and house them. The accompanying photos illustrate the use of the presses and the magnitude of the preparations to use them.

► **Keweenaw installations:** Two huge giant presses are being installed within the Keweenaw area—35,000- and 21,000-ton presses being built by E. W. Bliss Co.—will be installed at Keweenaw Minerals and Chemical Co.'s Newell, Ohio, site. Height of the 35,000-ton unit will measure 72

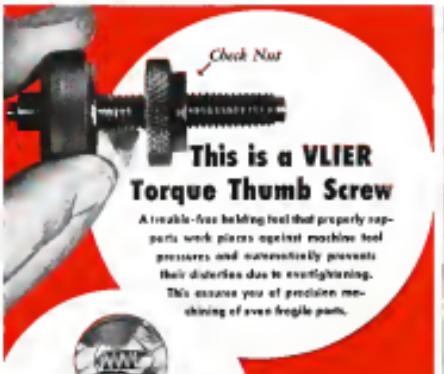
ft. from top to bottom toward axis; 11 ft. above face level, 39 ft. below ground. It will weigh 10 million pounds. The arms available is 24 x 12 ft. and maximum daylight opening—the up and down distance from bolster plate to bottom of the arms—is 11 ft. The eight wrench ends measure 37 in. diameter. Tiedown units weigh about 85 tons each.

Foundation pit for these 25,000 and 15,000-ton presses covers more than a acre of area and required the removal of 1,000 cu yds. of earth. As no stable ground foundation exists, the major piles planned to be laid in a underwater structure "Gatling" in the soil of aggregate of a glacial river bed, some 200 ft. deep at this point. At Allentown, Pa., the height of the unit—the cylinder housing—weights more than 225,000 lb., is 51 ft. wide

America's Cleveland works, a 30,000 and a 15,000-ton large press will be housed in a new facility about 10 acres in height.

The larger press, which is under contract to Martin Machine Co., will have an overall height of 30 ft. with 16 ft. of the unit below ground level. The smaller press, being built by United Engineering Co., will be 16 ft. high. Reinforced concrete foundations to support the machine will rest on pile groups 70 x 6 ft. in diameter. Also has had a 16,700-ton Goliath press in operation for about a year.

At Allentown, Pa., the plant, a 13,200-ton horizontal extrusion press will be installed. This is not short robbery between the smaller and the largest extruder—8,000 to 20,000 tons in the heavy press program, and its size is considerable. One casting for the unit—the cylinder housing—weights more than 225,000 lb., is 51 ft. wide



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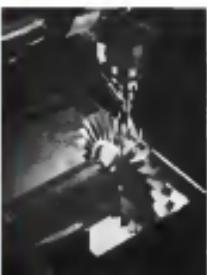
1. Regular-Type A—For normal supporting.
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Marquardt Designs Special Rotor Mill

Because Marquardt Aircraft Co. could not find an outside manufacturer to supply parts of required tolerance in pace with the company's experience using regular schedules, the Van Noy, Calif., firm designed its own special cutting machine for the job.

The parts set rotor blades—one used to drive a spur gear train for engine gear case, alternator and generator, the other a larger set, for driving the fuel pump.

The rotor cutting machine designed by Marquardt engineers utilizes a complicated series of cutters and a fly-angle cutting head, turning at 1,000 rpm. Cutting is done with end mills and index heads.

Rotor materials are a chrome molybdenum alloy steel and 245 T sheet-magnesium alloy. The blades are cut from a turned blank, with a machining operation that necessarily adds a burring operation before final combination.

High-Temp Wire

Tensioned high temperature hook-up wire is available in the Peer Teflon type, withstand temperatures ranging from -150° to 700°F with little loss of strength, according to the manufacturer. Insulation is claimed to be clean-shipping, noncorrosive, resistant to most oil solvents and to be able to withstand abrasion. Flexibility, insulation resistance and electrical strength are claimed as extremely good.

Tensioned wire is full-size production and is available in sizes from AWG 10 through 20 in stranded silver plated copper conductors. It is also available in special sample lots. It is made in 14 mils to simplify tracing and trouble shooting.

Peerless Industrial Wire, Inc., 196 Main St., Tuxedo, N.Y.

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Model #100
Model #100
Model #100
Designs—see page 100
Model #100
Designs—see page 100



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Valve Talk

for W.M. B. WHITTAKER CO., LTD.

By Marvin Miles,
Senior Member, Aviation Writers Assn.



What of the Future?

What achievements will be on the record by the end of 1962?

Based on the past ten years, fastest decade in history, the possibilities are startling. But to envision them takes more than a knowledge of the past and present. The prognosticator should be close by men who already have authored a good share of the epoch that is aviation.

So I asked two of my favorite experts for their ideas: Ed Heinemann, chief engineer, Douglas El Segundo (MM), Skystrut, Skymaster, Skycoach, Skyknight, Skyway, ASD), and Bill Hibbard, Lockheed engineer, vice-president (P-38, Ventura, Super Constellation, Shooting Star, T-33, Starfire, P-2V Neptune, C-130A).

Here is Ed's thought:

"There is every indication that by the year 2000 we will be traveling speeds of 1,000 miles per hour and distances of 10,000 miles per hour, at altitudes of approximately 40,000 feet."

"Then in half the speed of the earth's rotation at the equator, or conversely, to the radius of the earth from the center of the Great South American continent at an east-west crossing of the North America, the air will appear no different in the same position in the sky. As a result, it is my opinion that it will make possible landing at the same time as takeoff."

"Military aircraft speeds should be there by experience in several flights. But it is doubtful that commercial aircraft will be flying at speeds of 600 miles per hour in six years and approximately 1,200 miles per hour in higher altitudes under great atmospheric pressure, winds and other environmental factors are remote."

"They come in about the middle of the decade, and the best of air fractions. Air traffic is and continues to develop to withstand higher speeds. The question is, can the aircraft stand up to such speeds?"

"There are many reasons why aircraft, like the supersonic transports, are dependent on the earth's atmosphere for their lift and thrust. In this field of research, and also planning, the use of supersonic aircraft is the most important of the aerospace, the future appears unlimited. Since these developments take much time, it is difficult to predict exactly what will be the major aerospace during the next ten-year period."

"With these are many difficult problems ahead, the future of aviation in so many fields appears almost limitless. The second half of the Twentieth

has been dedicated to what is called the Requirements Division, which is supposed to list all that the Air Force needs or wants based largely on its own experience and reports from the field. Note, however, that in this present state of activation, nowhere is there an experienced engineer who has studied the operations of aircraft in a field or each a way as to be able to design a totally new air passenger. Instead, we have only lower echelon officers, none of whom could either have thought of or have been competent to consider a really new project."

"If there was an inventor looking for help on a new idea, he would have to go to the Requirements Division. He would leave there that, since he was not a member of the staff that drew up requirements, a requirement for an invention and not even a function, it could not be helped."

"It does not take much of a review to see how badly this super-organization after a period in the Air Force has bothered and delayed the real progress of technical aviation in this country."

"Of course, one of the reasons that this questionable Air Research & Development Command was established was on the high recommendation of aerial Air Force general James Doolittle. No doubt, the possible preservation of secrecy had a good deal to do with his recommendation."

"The Air Force today, being a positive, if they wish, to assist the aviation industry, almost overnight. Was this the reason?"

"The Air Force itself has now thousands of technicians, engineers, designers, qualified engineers etc (qualitatively, spending a good deal of time and using a good deal of paper merely writing letters to each other) who are competing with industry in developing the advancement of aviation."

"The continuing obligation of maintenance in the Air Force are becoming so prevalent—the notion of approach and departure as mandatory, the operation in all personnel—and the permission to do this and that is manufacturing as controlling, that the Air Force is practically doing its own manufacturing, already. Certainly, the government is in such control that the industry is under a few constraints that is not too healthy."

"Now comes Norden." Not only do we want to look and see if this is really what we want in America's private enterprise economy, but we also could well look and see whether it is in the character and conduct way."

"It certainly is not the prudent because several new European prototype developments have come about so

of all the World's International Airlines*



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Restrictions on forces forced engineers in the Toolmaster Products Division of McGraw Electric Company to find substitute materials for a pneumatic damping device in the toast ejection mechanism. They had been using a cylinder, machined from solid 36-ksi brass rod, and a precision ground brass piston with a connecting rod in a riveted joint. The cylinder head was fitted with a spring and bell crank valve. Tolerances on this complicated assembly had to be held within .3 mils to give satisfactory performance for at least 100,000 cycles at 380°F.

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quickly as to make our American system fast, simple and inexpensive.

"Also, we are now in the clear advance that Europe has in place and yet transports and many other factors do not develop as well as they are. This is another advantage which is not concerned with the super-expensive technology that we have to deal with over here."

"When we approach the question of aviation in the states and between the states of this country, we find that the Postage very little relation and the little expense required for how much of our article of aviation facilities have been done already in private enterprise."

"One of the best studies appears in Florida—at least at a case largely closed. Myself, I could not control it caused by the Air Force still. This is a typical example of what kind of pressuring helpful which will be lost in our development if we allow the military mind and the Postage pathology to sink to control aviation, as far as all the signals, as they appear to be trying to do."

"Somehow, somehow, we got to point out that the business of the Postage is not to control aviation or any other economy. Its business is to shoot down the cause. That's all. And when it comes to this different business of the military, we are in an unfortunate position in the Service of the Air Force and the civilian heads of aviation who must tell the civilian that the civilian community and its value in war is much too valuable to be tampered with."

► CAR, CAA Enraged—The speaker said that the Civil Aviation Board and Civil Aeronautics Administration should be counted on to champion civilian aviation, "not only aircraft but also that weaker sister, postal flying, which will become stronger again only when we advance enough as design to be more useful."

On longer hauls at CAA-CAB activities in recent years, Mr. Lanning wondered whether this branch of government has fought its battles in the right place.

"It has done well, of course, to raise arms," he said. "But how necessary is it for the government to take such detailed specifications on new aircraft to appear? Nothing like this is done in automobiles.... To be sure, in earlier days there may have been a similar to detailed government regulation. And in the space age field, the engineer CAB has done a magnificient job to assist the public's safer means of travel."

"But in design and development work that 'Pope knows best' becomes a definite drag on progress."

"Also, the present system is so costly and time-consuming in the new design that disengagement is evident by the way few new accepted designs

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SECTION VIII, Jersey 18, 193

Under One Roof

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ENGINEERING

TOOL DESIGN

FORKERY

PATTERN SHOP

NEAT TREAT

PLATING

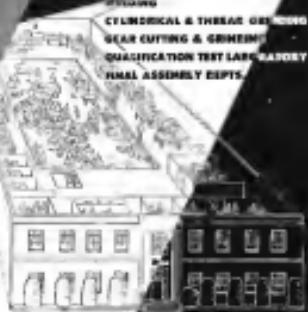
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position. That freedom is given to permit the flexibility and initiative needed in particular national defense activities. This has been used, however, sometimes to assume favorable positions which are contrary to the government. To the degree that such actions have been diminished, director responsibility upon the defense establishment has been increased. There is the danger that the national desire for flexibility and speed in procurement will result in a general relaxation of controls by management and the science spans large concerns, and they must act soon. For these reasons, I am asking you to specify detailed standards to guide your procurement offices concerning the placement of liaison with major contractors and the communication code which may serve the general policy of shortening for bids. It is of great importance in procurement matters to establish standards and directions to guide all personnel who have authority to place contracts. Different deliberations in administration and policies can make a difference in the ability to decide about the wisdom of the new procurement system."

The president's popular apprehension that the new legislation would lead to an outright placement of contracts by negotiation is not well founded. Today, we encounter a negotiation not only for aircraft and engines, but also for parts and bolts and thousands of smaller items which are completely standardized and entirely suitable for public competition. The protection that exists among World War II for wholesale acquisition is still there.

Although President Truman has declared a state of emergency, industry is still even more at a disadvantage than before it because of competition for defense contracts.

Procurement of arms and bolts and other highly competitive standardized items by negotiation represents a corruption of the original intent of Public Law 151. This law expressly was intended to allow flexibility in the procurement of large items of equipment, where the nature of the equipment makes it difficult to determine exactly what and where it is located so that it can easily be accounted for to come in on price, delivery, and other contract considerations.

Although these are no consideration involved whatsoever in at least 95% of the selected procurement of defense equipment,

The energy leaders, many having submitted a proposal on a negotiation, usually sit back and expect to be called in for "negotiation." The law considers as using a standard a manufacturer, table and language which are standard, and which are being used by a contractor. Based on application and after sale source, this rarely happens. The proposals are evaluated on the basis of low cost delivery, facilities, bonding, and other considerations much the same as are formalized bidding, bid, and a contract is awarded in view of the fact the bidder fulfills requirements of "negotiation."

The only major difference, avoided are that a proposal on a negotiation requires a cost breakdown of the item whereas this is not required on an advertised bid.

Furthermore, negotiated proposals are not opened and read publicly as are advertised bids, and it is impossible to find and lose you stand in the competition until after a

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New Gyro Simplifies Polar Navigation

Eclipse-Pioneer 'Polar Path' high-accuracy unit proves itself in SAS DC-6B trans-Arctic flight.

By Philip Klass

A new low-drift, high-accuracy directional gyro, developed by Eclipse Pioneer, recently proved itself an extremely useful device for polar navigation during the first trans-Arctic flight of Scan Enviro's Airline System from Copenhagen and during the second flight to Greenland.

Soon after the SAS DC-6B passed Whitbyair's radio beacon on the Ekofisk to Whidbey leg of the round trip flight, the Polar-Gate transpolar compass master began to oscillate. The flight was still 1,000 miles away from the North Magnetic Pole, and Navigator Polden had planned to make the compass to within 500 miles of the pole.

For an accurate heading indication, independent of magnetic influence, Polden switched in the new EP directional gyro, appropriately called "Polar Path." Pioneer's flight record intro-graph log showed that random gyro drift was unacceptable.

EP says the gyro may be expected to show random drift rates of one degree per hour or less, compared to rates of six to eight degrees per hour for conventional panel gyros.

• **Nose Confinement**—The earth's magnetic field, which provides an ac-

cute magnetized reference, is fast moving in orientation, so the attitude sensed by the gyro and hence gyro errors, in the region of the North Magnetic Pole. The horizontally pivoted compass needle, which tries to align itself with the longitudinal component of the earth's field, becomes hopelessly confused in the region of the magnetic pole where the lines of magnetic force converge. (North and South Magnetic Poles are located approximately 71 and 75 deg. north and south latitude, respectively.)

The gyro is fundamental in that it is a single-axis gyroscope and is the EP Polar Path Gyro. Its compass element is conveniently stabilized on a vertical axis, but it rotates equal liaison with a compass-driven directional gyro. (The latter is a polaris development in which the directional gyro is electrically coupled to a novel compass element to maintain the gyro continuously aligned to magnetic north and thus to prevent gyro drift if needed.)

EP says the gyro may be expected to show random drift rates of one degree per hour or less, compared to rates of six to eight degrees per hour for conventional panel gyros.

• **Map Projection**—Conventional Map projection charts which supply Great Circle (shortest south) directions at several latitudes are of little use in the polar regions where meridians of

longitude are straight lines. Instead, the pilot must use great circles, which are curved lines.



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Gate servo amplifier is used only with the magnetic detector.
The one vacuum tube and an the Polar Path servo amplifier will be required. The magnetic amplifier is in-line model.

Total system weight of the five core panels (flux Gate compass, amplifier, MDR, Polar Path, and synchronizing control) is about 25 lb.

If the Polar Path DDC could be designed to permit it to operate as a compensated DC without sacrificing its basic accuracy, EEP could cut system weight appreciably. However, if EEP has such plans, it is not talking about them.

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► **Airco Sets Better ADP**—Armstrong Radio, Inc. (Arlon), has recently organized a new subcommittee (of its Airco Electronic Engineering Committee) to draw up a specification for an improved airborne automatic direction finder (ADF). Objective of the new specification is to define characteristics of a smaller, lighter, more reliable ADF. Presently used ADF designs are in aid of aviation standards. With eye to future transports, Airco spec may call for fundamental ADF improvements.

► **Fuse Components**, Build Kit—I—the USAF's K-11 rate bending meter, developed by Sprague Corp. and E&I disclosed this spring, is now being produced by three other prime contractors when Sprague helped set up. These include A.C. Spark Plug division of General Motors, International Harvester Machines, and National Cash Register Co.

► **GE Holds Test Clinic**—A hundred engineers from 27 Bomarcos defense manufacturers gathered in Houston on Nov. 26 and 27 to develop and have test in the then as yet secret Central Electronica Intercommunications plant held at Baytown, Tex. GE started the tube cluster under this a year ago.

► New Components

■ **Adjustable High-Q capacitor** can be adjusted to values between 1 and 10 millifarads and is suitable for high frequency applications. Constructed of silver plated brass and Phenyl glass, supercapacitor uses metal foil of 16,000 to 1 ratio (Johnson Met. Corp., Boston, N. J.)

■ **Motor coil former** with flexible frame is needed for winding the armature by hand for field coils. Core of the coil form, called Flexiform, is made of dielectric insulating paper (Phoenix Paper Tech Co., 1815 W. Charlotte St., Chicago 16, Ill.)

EQUIPMENT

Plexiglas Properties

PROPERTY	MEASUREMENT CONDITIONS	PLEXIGLAS T3	PLEXIGLAS T3 UVFA
Formability		Unlimited	Unlimited
Clarity	6 transmission, visible light	92%	92%
Impact strength	FT-R (4" x 1" notch, Charpy Unreinforced Bar)	4.5 lbs	4.5 lbs
Heat deflection point	T _g Glass 265° F	162°C(313°F)	98°C(208°F)
Stress relaxation	ASTM test schedule	4,800 psi	1,500 psi
Stress crack resistance	Ovalbar exposure at 3,000 psi, from May 1952	85 days	23 days

Plexiglas Craze-Resistance Raised

Type 55 withstands greater pressures, temperatures than previous formulations; outdoor life extended.

By George L. Christian

Philadelphia—A new type of Plexiglas, an infrared product at the Rohm & Haas plant here, has greater resistance to crazing and heat than the company's present widely used acrylic, Plexiglas T3 and T3, while retaining their advantages of visual clarity, workability, light weight, clarity resistance and flexibility.

The new material, Plexiglas 55, has raised craze resistance up to 4,000 psi while subjected to the action of various solvents. The heating craze resistance stays the same acrylic materials at 1,500 psi.

In outdoor weathering tests, at 3,000 psi stress during summer months, its average resistance has been increased

to 85 days from 22 days resistance for Plexiglas T3.

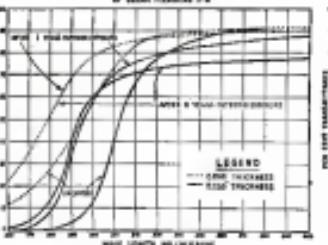
This heating point has been raised to 218°F from 208°F. Heat was applied at the rate of 3.67° per minute, at 204 psi.

Fabrication—Plexiglas 55, developed by Rohm as a "modified acrylic," is easily formed into sheet, extruded, injection-molded, and cast into various shapes.

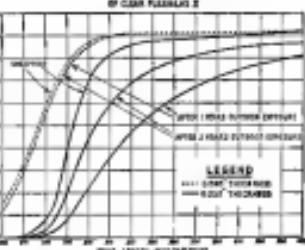
Rohm generally submits any new material to contractors at least six months before introducing it to the market. It has done so in various parts of the country. Their sales geographic areas—South, Middle West, East Coast—stays open to a wide range of climatic conditions. "There is as way of accident," says the company.

Acrylic plastic is still the standard outside glazing material, according to Rohm & Haas. The company says

INFRARED LIGHT TRANSMISSION CHARACTERISTICS OF CLEAR PLEXIGLAS T-3



INFRARED LIGHT TRANSMISSION CHARACTERISTICS OF CLEAR PLEXIGLAS 55



the plastic film out a good part of the ultraviolet ("sunburn"), light band which is from 350 to 320 millimicrons in wavelength. Material used as ultraviolet ray blocking must be compatible with the plastic, colorless and able to absorb a large percentage of the energy band.

"It is Rohm's claim when used with exterior Plexiglas 55 or 11 it is indicated by the two stars at the bottom of that page."

They show also light transmission below approximately 330-340 millimicrons. [Plexiglas 55A UVFA qualities are identical to those of Plexiglas 55.] ► **What's Up?**—Rohm & Haas spokesman say that the USMA Materials Laboratory and Bayer have tested Plexiglas 55 and space has been saved in order which the material is better. The plane is being flight and instrumented to both monolithic and laminated form on rotary autoclaves.

It is the first to go into production quantities on commercial scale—specifically Douglas DC-6s and -6As. Rohm officials add that many major aircraft manufacturers in the country are testing the material.

► **Interior Materials**—In spite of the improvements exhibited in Plexiglas 55, Rohm & Haas expect the plastic only as an interior material. The company's laboratories and technicians are actively engaged in developing glazing materials with even greater resistance to crazing and heat.

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KONIGSLOW

"there is no other gluing material now available that can be formed into the various complicated shapes now it is forced by the aircraft industry that will determine the transparency of optical glass."

French Importer—Company representative work with both defense designers to produce proper mounting designs for transparent flightglass enclosures.

The ideal mounting they say is one in which the Plexiglas "floats". Stress should be evenly distributed along the entire periphery of the panel to prevent it from warping or causing any strain or distortion on the plastic.

OFF THE LINE

Intense, whacking of fighter aircraft motors that planes fly short long enough for the pilot to get home to the USAF has developed a unique new test device which can be set up in seconds on the tail of the cockpit. A small can of water is placed in the oven. The pilot gets into his seat, heats the pump to proper temperature, lets out off the top of the can via the pilot.

Aerospace Division, Industries, Research Hill, N.Y., has received a Civil Aerobatics Administration Repair Station certificate, the first to be issued in the New York area, according to the firm. Control of the certificate means that the company's aircraft maintenance facilities meet CAA standards.



METHUSELAH PUMPS

Four horsepower, one thousand bushels per hour and three horsepower rated life of NWA's DC-4 engine oil pump installed, the claim shows. The steel housing is placed in the pump's cover plate bolts and the housing bolts go in the three holes adjacent to the steel pumping gear in the center body of the pump. Suggested by L. Zimmerman, engine shop parts and materials supervisor, the plus has cost \$4,000 in its first year. Formerly the pump, costing \$240 each, was discarded after 3,000 hours of operation, according to Northwest. The findings are claimed: very little leakage.

NEW AVIATION PRODUCTS



Bomb Hoist Motor

An armament motor with multi-speed winding, having six driving bands and similar applications has been placed in the catalog by U. S. Electrical Motors, Inc.

The unit is a double-reduction epicyclic gear type. Fan blade is directed over heat dissipating fins for maximum cooling. Motor is said to have high torque and rapid acceleration. It is a 400-c. r.p.m. a.c. type, delivering 6 hp at 11,000 rpm and 12 hp at 6,250 rpm. Brake for the motor is operated by d.c. current.

Aerospace Division, U. S. Electrical Motors, Inc., Terminal Annex, Los Angeles 54, Calif.



Camera Recorder

Type V-10 Photographic Recorder Camera is a remote controlled camera and capable of continuous operation. It has a built-in servodrive for automatic operation at pre-selected intervals. Its function is to provide a photographic record of instrument readings, status of personnel, components or performance of a complete test such as an engine loading or takeoff.

It is designed for use in flight-test

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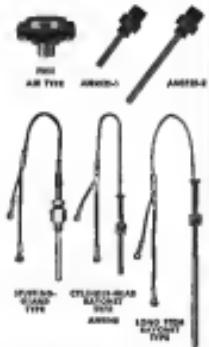


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sealed, with **AN552** standard insulation
and optional insulation requirements.

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humidity. It includes the economical liquid
temperature recorder.

Internal-tube — Type has probe
resistance smaller than the bulb. Has
shorter response and is used with auto-
mating equipment. It is available with
standard or liquid insulation.

Temperature Recording — Used with
AN550-2 standard. It records in increments
of 10° F. It can record from -100° F. to 100° F.
from 100° F. to 200° F., or from 200° F. to 300° F.

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individual specifications.

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program, in gated cameras, in testing laboratories—wherever data can be re-
corded photographically.

The V-10 camera weighs 11 lbs. and
accepts 300 cu in. Construction is
all-plywood. Weight never exceeds
distance. Temperature range is from
-30° F. to 160° F. altitude range—0 to
85,000 ft.; humidity—in 95%; power ac-
ceptance—5 amp at 22 to 29 v d.c. Re-
mote control and power circuits enter
the camera through a standard AN
connector located on the rear face of the
unit.

The V-10 is not a modified motion
picture camera; it makes up, at least in
a new design based on more years of ex-

perience in the application and opera-
tion of photographic recorders for
flight test programs.

Type M-1 camera is similar to the
V-10, but is provided with a sealed
internal case and a separate ground
for each lead wire, material insulation
temperature range—30° to 200° F.

The V-10 Camera is designed for
recording of instrumentation data and
test circuit response in the laboratory.
Remote control operation permits
"close-in" photography of hazardous
areas without dangerous exposure of
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Public Laboratories, 12335 Venice
Blvd., Venice, Calif.



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NEW TINNERMAN HARNESS CLAMP with Safe Interlocking Tongue and Slot



4-0-4 Flap Valve

A pressure relief valve for aircraft, which is said to have "several important military uses," has been put into production by Parker Mfg. Co.

The valve is a cartridge type, designed to be insensitive to system or bulk pressure. The seat is being used in the Martin B-57 and helps make possible the self-positioning wing flap system of early design.

So that flap valve positions smoothly and automatically according to a pre-determined schedule during takeoff and approach, the relief valve, located in the flap drive line, maintains a constant inlet pressure with maximum fluctuation over a wide range of flow and pressure conditions in the system.

The new valve is a modification of another Parker unit built to MIL-N-5321 specifications and used by a large number of aircraft and engine firms.

Parker Mfg. Co., Inc., Hydraulics Division, Peoria, Ill.

ALSO ON THE MARKET

Universal joints with three to eight pins transmitting in ball sockets permit free rotation at any angle up to 90 degrees and load up to 1,000 lbs. They are claimed to be more efficient than other heavy gear drives, having several pins, each carrying 100 lbs. weight. **Flem Vesel Co.**, 1181 N. Monroe, Peoria, Ill.

Metal cleaning tank, designed for a wide range of associated operations, combines high pressure degassing, washing, rinsing and cleaning in one automatic cycle. Equipment can be and also for descaling, pickling, high-pressure rinsing, water softening and electro-plate rinsing. **J.P. Morris Co.**, 190 E. Front St., Youngstown, Ohio.

Military switches, made to MIL-S-4746 and Air Force Navy Standard Drawing AN/SQS-2, are available in SPST and SPDT versions with mechanical or magnetic contact, from Auto-Hart & Electric Co. Co., 103 Broad St., Hartford 6, Conn.

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AVIATION SAFETY



Full Report on Comet Crash in Rome

The official report released by the British Ministry of Civil Aviation's Aircraft Investigation Branch on the crash of BOAC's GALTY jet Comet at Rome's Ciampino Airport blames pilot error.

The captain was at fault in "not appreciating the crew's nose-up attitude of mind during takeoff," the board said.

Except for one passenger, the cow and passenger escaped unharmed. The infant was severely dismised.

The complete report follows:

• Nominations

The MCA Office of Civil Aviation Duty Officer was informed by BOAC Management Control by telephone at 2140 hr on Oct. 18, 1952,

It was at first believed that the investigation would be conducted by the Italian authorities under the terms of the ICAC Annex 15, and as accredited representatives of the United Kingdom arrived at the scene of the accident at 0350 hr on Oct 18, 1952, during the evening of the same day the authorities delegated the responsibility to the UK representative and investigation began immediately. The Italian Government appointed an accredited representative



• 第二章 会议组织与管理

The search was opened Scheduled Passengers Service Flight No RA 215/839 from London to Johannesburg. The final stage of the flight began at London Airport

• FURTHER DETAILS

(i) The Aircraft

The aircraft was designed and built by the de Havilland Aircraft Co., Ltd., and was completed during September 1932. Its Certificate of Airworthiness, No. A 5212, was

At the time of the accident the sheriff's total flying time was 11 hours and 35 minutes. The airplane was maintained in accordance with an approved maintenance schedule and no major defects or malfunctions had been noted.

The Glastar 90 M-1 engine was de-

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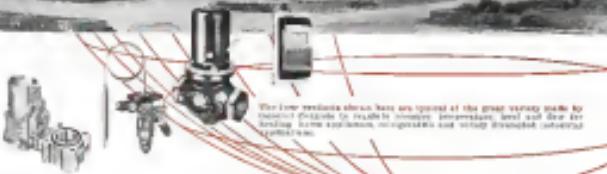
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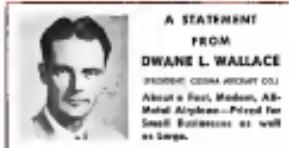
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age and was retained as a pilot by the RAE. In 1947 he was recruited to the RAE's flight test department at Farnborough where he was assigned to evaluate aircraft developed by the RAE. On Jan. 1, 1950, he was promoted to First Officer and soon after June 17, 1951, was employed in a flying attachment to the Royal Canadian Air Force. During 1951 he was given technical and flying training in the evaluation of Convair aircraft and on Dec. 24, 1951, was recruited as a RCAF Corroborator of Competence to no doubt the most advanced aircraft of Convair design. He was promoted to the rank of captain in the Canadian Forces and was given flying and navigation duties in both the Avro LAK and the Canadair CL-13. On April 23, 1952, he was promoted to First Officer and on May 26, 1953, to Captain. On the latter date in this capacity he was appointed as a First Officer and Navigator in Convair's aircraft on May 9, 1953.

He has flown a total of 3,212 hours of which 519 have been with the F-101A as first pilot of multi-engined aircraft. The total includes 205 hours by day and 416 hours by night as second pilot on Convair aircraft.

101. Author Transport Pilot's No. 25635 with current Instrument Rating Instructor's Rating for multi-engine airplanes and Aircrew Ratings for Convair L-Comet and Tiger Moth or Group II and Viking, Lancaster and York in Class H.

[iii] Flight Navigator's No. 2832.
[iv] General Flight Radio Telephony Oper-

He was last regularly examined on May 5, 1913, and passed fit for flying duties.

1st Lieutenant, First Officer.
Last Officer F. E. Hampshire at 35 years
of age and was turned in a jet by the
RAF. On Jan. 21, 1948, he was engaged by
the BOMC as First Officer. He was posted to
the commanding Comet Fleet on June
16, 1952, and up to the time of his accident
he had flown 27 hours, 18 by day and 9 by
night, as second pilot of Comet aircraft.
His total flying was 4,556 hours as first
and second pilot.

He holds the following license which was valid at the time of the accident:

[b] Section 1975(b)(1) with current Investment Rating and Analyst Ratings for BHPB's IV in Group I and Dakota, Laramie and Tark in Group II
[b] Flight Navigator's No. 14-08.
[b] All rights reserved. © 2000, Kiplinger's Personal Finance Media Network.

(a) The Engineer Officer
Engineer Officer S. L. Bolton is 29 years of age and joined the RWDAC as a ground engineer in 1946. On April 26, 1947, he was transferred to the air crew section for flight training.

During the period Dec 17, 1951, to Feb 22, 1952 he was given technical training in gas turbine engines and the Comet aircraft followed by instruction in flight planning and route control.

On completion he was assigned as Engineers Officer in the type 100 boat frig. On Aug 14, 1952, he was appointed Engineers Officer of Convoy yourself after having undergone completed further training (Aug 7, 1952-Aug 12, 1952) over the route U.K. to Japan via Shanghai. He has flown a total of 5,000

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house with the BOAC as Engineer Officer of which 175 hours have been in Comets.

Mr. Robins holds a valid Flight Engineers License No. 339, endorsed for Comet I and Hercules aircraft.

(c) *Aviation Executive Computer Officer*

Computer Officer T. G. Brookshock is 31 years of age and joined the BOAC as a ground engineer on Aug. 24, 1946.

On July 7, 1947, he was transferred to the engineer's Control Staff for training as an aircraft engineer.

He passed Flight Engineers' License (Control Class) No. 495 endorsed for jet turbine powered aircraft.

(d) *Radar Officer*

Radar Officer T. J. G. Max Bell is 36 years of age and joined the BOAC on Jan. 1, 1942. He holds Certificate of Competence (WVE and R/TD) No. F1478 and Flying Class Flight Radio Telephone License No. 1250 which was valid at the time of the accident. He has flown a total of 520 hours on Radar Officers of which 180 were on Comets.

The Weather

Weather conditions prevailing at the time of the accident were recorded by the Meteorological Office at Compton Airport as follows:

- Weather: Cloud cover slight over 10 miles. 10 km.
- Wind: 10-15 Kts. 10 hrs.
- Cloud: 100% B. 400 meters.
- QNH: 1003.3 mb. Death end of runway 10. 998.6 mb. End of runway 16.
- QNE: 1007.4 mb.
- Temperature: 26°C.
- Dew point: 18°C.

(d) Compton Airport

The pasture area is 400 ft.

Rainbow 36 is unenclosed and has an spill gradient of 3.1%. It is 186 ft. wide and 7,250 ft. long with no curvatures. White variable intensity Rotovex lights 211 in three general level are installed along both sides of the runway.

(e) The Flight

The Compton scheduled passenger service to Edinburgh is made via Rutherglen and Glasgow. Flight No. U1500 flew from London Airport on Oct. 26, 1952, at 1555 hrs and arrived at Compton May 15, 1953. The aircraft had a weight of 465 kg. The aircraft was made without cameras and an entry in the Technical Manual "No cameras" was made by the Captain.

All Routine, four of the passengers dined aboard and five passed the night. The aircraft had a weight of 465 kg. The aircraft had a weight of 479.5 kg. The aircraft was referred to a capacity of 1,575.5 kg. The Captain checked weekly three days per month. On completion of the traffic and control procedures the engines were started and test clearance and no anomalies were noted and direction were given to the crew to take off. The aircraft was cleared in Economy 16 and cleared on the control line. All pre-takeoff checks were made and the elevators, ailerons and rudder trim were set at the neutral position. The Captain's evaluation of visibility was 5 miles level with no haze.

The aircraft was cleared to 15° and the weather was wiped out both morning. The engines were ramped up to full power and

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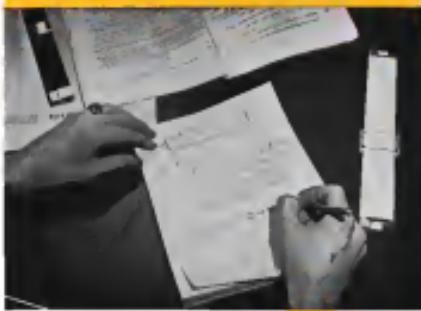
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OPERATIONS ANALYSIS

the location switches were set to "locked." The rpm were checked at 10,210 and oil engine fuel flow, engine temperatures and pressures were reported to be correct. The brakes were released and the aircraft made a smooth takeoff. At 10,000 ft, the nose wheel was lifted from the ground and the aircraft had a slight tendency to swing to starboard but was corrected.

At an altitude of 512 ft, the Captain noted the sound from the ground by a positive downward movement of the aircraft roll axis and what he considered to be the aircraft had reached "one height" before being called for "undercarriage up." At about the same time, about the post-wing dropped rather violently and the aircraft went into pitch; the controls gave normal response and lateral level was again quickly restored. The Captain noted that the aircraft attitude was not tracking up, although he made no reference to the ASI. A pronounced pulsing roar and shudder was felt by the crew and with the onset of a stall and in spite of free successive movements of the rudder pedals, the aircraft did not respond. After the first 100 ft, the aircraft began to roll in other undershoots up, the aircraft came down on its nose landing wheel and stopped.

It was very quickly evident to the Captain that the aircraft's speed was not increasing and that it was not possible to increase the aircraft's speed. He also noted that the aircraft was rapidly approaching the end of the runway and a decision to climb the tailhook was made. The undershoots struck a series of rocks to be seen along the taxiway and the aircraft suffered a series of extremely violent undershoots. The undershoots were terminated off and considerable damage resulted; a large spillage of fuel occurred but the did not break out. One passenger suffered slight shock and another sustained a cut on his head.

Subsequent investigation of the new configuration found that all engines had given their maximum power and that fuel flow, temperatures and pressures had all been normal during the takeoff. It was the belief of the First Officer that the nose wheel was lifted from the ground in the usual manner and that the aircraft attitude was to be "too low to land." He also thought that the "shudder" was made by moving the control stick half way back from the neutral position and that it was held there until the post-wing dropped. He also thought that it was not possible to determine aircraft attitude from the horizon as no master lights were visible to him.

Due to darkness and due also to the fact no ground lights had a clear view of the aircraft. One, however, who observed it from a point opposite the takeoff position of the aircraft, stated that the aircraft's attitude was "tail high" at ground level. He continued to observe it as the nose ran exceptionally high and he was not aware that the aircraft became airborne.

On inspection of the aircraft, the tailhook track and the deployment of the recovery gear were examined.

An inspection carried out at the scene of the accident showed that the aircraft was about 350 yards from the upward end of runway 18 and was 100 yards from the boundary fence; considerable damage had resulted. A large spillage of fuel from the post-wing integral tanks had occurred but

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MULTIPURPOSE HYDRAULIC TEST STAND

Used to check the efficiency of such items as hydraulic pumps, aircraft pressure regulators, valves and fittings. Unit is furnished with variable speed drives and fast and slow several different complete hydraulic circuits to provide a very flexible design. Unit includes pressurized and vented tanks, normal high and low pressure pump circuits and always shifted out of variable static load of aircraft. Complete interchangeability of testing tool piping circuit make this a universal test stand.



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Used to measure and check output of lubricating oil service and supercharger pump. Pump is mounted on test pit (optional design available) and suction and discharge are subjected to pressure and temperature simulating actual operating conditions. Variable speed drive, 0 RPM to 5000 RPM (or greater), is furnished in either hydraulic or electric motor design.



BLUSHING STAND

A means of cleaning and preserving parts of aircraft gas turbine after flight test and before shipment. Unit includes complete pumping circuit and heated storage facilities for cleaning and preserving oils.



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Used to detect any leaks in piping systems in jet engines. The engine is mounted on a power driven rotary stand which provides the external rotation required for the Leak Check Stand. The stand is then rotated - right-hand, counter-clockwise and each piping system or the engine checked for pressure drop, etc., to assure that no leaks have developed in assembly.

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There's more to rubber than bouncy rubber parts, therefore, must be specifically engineered to meet the requirements of their intended applications. In addition to elasticity, many special properties are essential for dependable performance. These include: resistance to extreme temperatures or weather conditions, the ability to withstand oils and other petrochemical derivatives, resistance to various chemicals, and long life despite abrasive actions encountered in many applications.

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he did not knock out. Both landing skids had dropped. The two crash safety operating levers functioned correctly and the vertical boomless fire extinguisher bottle had discharged.

The seats and their attachments to the crew and passenger compartment were un-damaged. The crew's forward entrance door and the passenger entrance door had moved rearward to clear the emergency hatch. The forward door is set forward 10 degrees of about 15° and the corresponding 10 degrees of about 15° is indicated on the cockpit. The elevator, aileron and rudder trim indicators were in the neutral position.

When marks on the aircraft showed that the aircraft had landed with the front gear first, the front gear was bent 34° at its length. The seat impact was made on two rounds of earth when the aircraft had the undercarriage wires wounded all and parts of them were damaged the tailplane part of the shock absorber was broken in the middle. The point front gear which was forced out struck the ILS antenna with the nose. The point main gear hit the runway disconnection indicator which it mounted on one side. Brake and the wing flap and pilot hand were how off. The steering gear cylinder strike had been detached at its lower end when the attachment bolt and nuts had started due to impact forces. The detachment allowed the engine to rotate in its mounting brackets through the main plane arm and in a total shear direction. The nose wheel was forced upwards into the bottom of the tail boom and was bent from the top section of the fuselage. The longeritudinal bracket was subsequently found in the wreckage pile. An examination of the bent landing gear was made and landing gear was deeply scored.

A search made along the runway revealed evidence of a small metal object dropped at length from 3 ft. to 40 ft. These marks extended along the last 650 yards of the runway and showed that the aircraft's track was inclined a few degrees to the northeast of the runway center line.

Subsequent Tests

The Captain's and First Officer's steered indicators and artificial horizon were removed from the aircraft. They have been checked for operation and found to be within the prescribed limits.

DISINTEGRATION

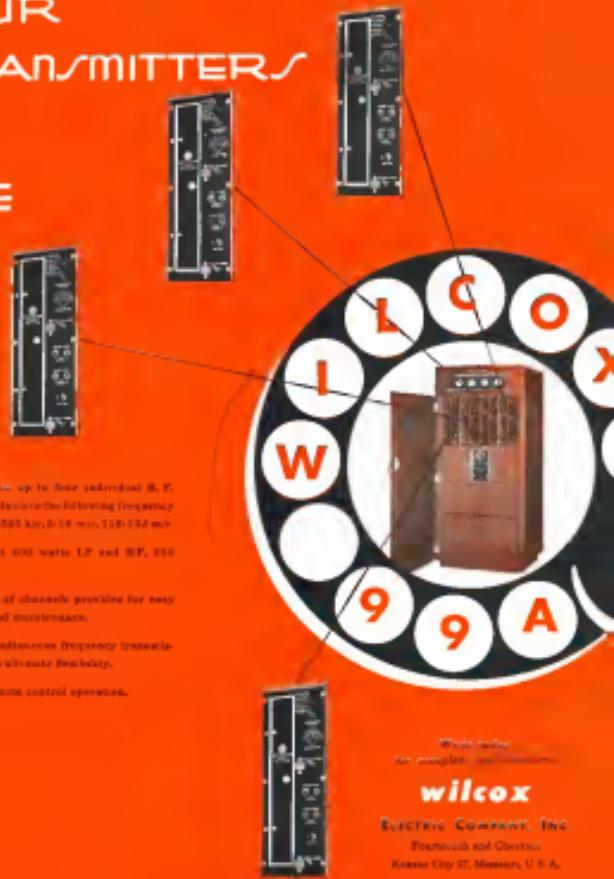
The BOAC Testing Manual recommends the following takeoff technique: "If fit to, the nose should be lifted until the number of nose wheel turns ... Care should be taken to keep the aircraft straight as longitudinal oscillations should be anticipated prior to acceleration."

The normal landing sequence during the identified period was a short 25-30' after the nose wheel has been raised just clear of the ground. To do this a broken thick piece of wire was required to support and stop an unguided tailplane strike with a consequent poor acceleration.

The attitude of "tail-off" is approximately 4°-6° and to attain this the required rock movement at the time of losing the ground is of the order of 6° which has from the normal position after which the skid must be returned towards the pre-takeoff position.

Initial tests by the manufacturers have shown that a constant 4° incidence of flight

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legs during the ground run gives good re-calls for distance run and for clearance between legs. They have also shown that an increase of clearance to 9° results in a greatly reduced wing going high drag which appears to allow the aircraft a better performance and that the aircraft is more approachable to the pilot as a low frequency bell. The aircraft returns from its nose-stabbed position if the nose is pushed well down.

Appendix "A" shows a diagrammatic representation of the nose-up position of the aircraft with an angle of 9° between the horizontal (at 8.41°) nose up. The Appendix also shows that for the full length of the track the ground angle is of at least 11.1° as required.

CONCLUSION

1. Aircraft's documentation was in order.
2. The nose were properly balanced.
3. The ideal weight and the position of the CG were within the printed load limits.
4. The pre-flight status of the nose were correctly done.
5. There was no failure or malfunctioning of the aircraft's own equipment.
6. The aircraft's overall configuration did not build up due to the progressive nose up attitude of the aircraft which was permitted to develop and which resulted in high drag and a non-rotational condition.

OPINION

The accident was due to an error of judgment by the Captain in not appreciating the extreme nose-up attitude of the aircraft during the takeoff.

COMPLIANCE WITH REGULATIONS

In conducting this investigation the provisions of paragraph (b) of Regulation 101 of Civil Aviation Regulations of Canada, Schedule Appendix 3, 1951—Statutory Form and No. T-103, at 1945 has been complied with.

VERNON BROWN
As Comptroller
Chief Inspector of Airports,
Aeromarine Engineering Branch,
Ministry of Civil Aviation



FILM FOR SAVAGE

A. North American AJ-1 Savage photo plane had its nose cone collision-locked with the magazine prior to flight trials to test the aircraft's handling and vibration characteristics. Assembly is simplified by using the lower section of the nose. The AJ-1, a reconnaissance version of the AJ-1, is in production at Columbus, Ohio.

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McGRAW-HILL PUBLICATIONS

Air Industry Briefed on ARDC Requirements

Pictured below are some of the 300 civilian industry, scientific and research guests invited by Air Research & Development Command to a special two-day briefing seminar at Barksdale AFB, on present and future planes, weapons and equipment needs of the Air Force. Guests cleared personnel were permitted to take part in the discussions and presentations by USAF officials.



PLANES Mrs. Ann Burch, head of Burch Aircraft Corp., flanked by Lt. Col. Farnsley (MC) and Maj. Gen. Donald L. Putt



ENGINES J. L. Kozalik, Minneapolis Aircraft Co. (second from left), with Lt. General Orval R. Cook, V.W. Wild, Continental Motor Corp., Lt. Gen. Clough and D.E. Walker of Minneapolis Industries



ARMAMENT Brig. Gen. E. P. Mervin (right) with L. S. Thibault of Sims Tool & Co. (center), and Paul S. Cooke, Convair Institute



TOP BRASS From left to right: Lt. Gen. Portridge, Lt. Gen. Cook, Maj. Gen. C. S. Irvin, Lt. Col. Louis R. Givens (MC), Lt. Gen. James H. Doolittle (MC) and Lt. Gen. George



AVIONICS Col. D. G. Raymond, Jr. (center) with J. M. Dyer (left) and John D. Whitmore, both of Aerobee Electronics Laboratories



PLANES & PARTS Gen. Joseph T. McNamara (left), Director (second left), talks with G. L. Rausch, Remond & Lamb, and S.B. Taylor, Federal Appliances, Brig. Gen. Mervin (center)

Patterson Takes Aircoach Fight to Public

- United president demands congressional hearing on his charges that CAB high-density policy is "unsafe."
- American and nonsubs Air America ask permission to fly coach service on UAL transcontinental routes.

United Air Lines president W. A. Patterson last week called his case against United to the public and Congress, insisting in writing that the high-density seating policy of Civil Aeronautics Board and other major airlines—Monarch, American, Pan Am, and the United-CAL flight—has a chance to succeed in an UAL's favor.

American asked CAB for permission to begin "modern stretch seats" in United's transcontinental routes. A nonsubs airline, Air America, made a similar request on grounds that "United has failed to provide the service which the public demands or its United's duty."

These petitions threaten intended competition on United's transcontinental routes. They also give CAB a stronger position with which to negotiate with Patterson and could influence him to drop his safety protest of this transcon, which is alienating the rest of the industry. Having no action open upon public confidence in the coach model.

► **Developments**—The other airlines display the CAB decision as how many seats a carrier should install on its planes. But in Air Transport Asia's official talk, AVIATION Week, the airlines display even more the current United attitude.

Next developments may include:

- CAB hearings as to why United's case must still not be accepted.
- Congressional hearings on alternative high-density coach seating in safe, and whether CAB has power to compel specific seating densities.

- Federal court case on appeal of United for stay of CAB enforcement action or an appeal of CAB to enforce the CAB regulation.

These pro and con outbursts cause a shock to the industry, which only a week before had hoped Patterson's announcement of forthcoming switch to DC-6 coach world would further open controversy on coach safety.

Patterson's demands against high-density aircraft has stirred the other air lines and Civil Aeronautics Board. Fellow jets in leading acceptance conference with weekly publicity about

a major airline alleging high density aircraft in transit could jeopardize much of the goodwill and trust the rest of the industry have built up for their growing cross business airline and CAB officials told AVIATION WEEK.

Monarch and Pan Am—Demand CAL demand

United insist that the Board let it offer coach fare on medium-density (54-seat) DC-4s, citing

► **Unsubstantiated** to change low fares for an essentially first-class service.

► **Stal CAB**

By regularly selling 10 seats less than the number specified as an airline can offer coach seats, United is able to offer coach service superior to that offered by other carriers who observe their own terms. The competitive advantage seems to be that practice can contribute an added element of convenience or comfort. Section 111 of the Civil Aviation Act:

"As to economies of the petitioner, CAL and that by cutting 'has payload,' Patterson made it clear he preferred for him to extend coach service to as many people as possible as the other airlines and the Board planned." □

► **Patterson Retaliates**—In a public statement issued simultaneously after that Board decision, Patterson suggested a congressional investigation of CAB policy, saying that "research as to a question of public safety seems to me at this time, it would appear appropriate to study . . . by some independent group such as a congressional committee."

Patterson added that the company would make no further comment "until it has an opportunity to further analyze the complaint by the Board."

Other spokesmen reiterated that the company, by continuing low-density coach operations, was technical violation of its rule. But that airline interpreted the CAB denial of its exemption request as giving until Jan. 16 for action (AVIATION Week Jan. 12, p. 15).

The following week United asked the Board to give approval within 24 hr. of a test flight almost identical to the exemption request. The Board refused.

On the same day, Jan. 3, Patterson announced what appeared to be the ultimate solution to the whole difference between United and CAB—plan to switch from DC-6 coach to DC-6 coach. The industry reacted gruffly. A top Air Transport Asia official told AVIATION Week that this looked like the way out for all concerned.

But the spokesman was premature. ► **United's** Eddie Patterson countered with full page ad in leading newspapers under the title "Is the 'Patriotism' of a Small Obligation to the People an Un-American Act?"

The ad charged CAB for its policy of limiting coach "to make air travel available to a greater number of people. It embodies a sound sense of responsibility to the public." We expect about 13% of our mileage in coach fare service and have a program under way to increase that to 25% in the near future."

Next, Patterson says that his safety campaign suggested that United's 66-seat DC-4 might not provide "adequate protection" for emergency evacuation. Thus, he claims, the National Fire Protection Association and the Flight Safety Foundation recommended "per passenger additional" (Flight Safety Foundation definition) Flight Safety Foundation.

As to economies of the Patterson proposal, CAL said that by cutting "has payload," Patterson made it clear he preferred for him to extend coach service to as many people as possible as the other airlines and the Board planned.

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The following week United asked the Board to give approval within 24 hr. of a test flight almost identical to the exemption request. The Board refused.

History of UAL's Coach Policy

Because studies status of long-range travel.

► **Jan. 23, 1952** Patterson sends telegram to CAB administrator asking him to look again at long-range carrier.

► **1952** All major transoceanic except United start coach service.

► **May 4, 1954** "Competitor consideration caused United to investigate aircoach service on the Pacific Coast early in 1950." United president Patterson says so in 1950 annual report dated Mar. 8, 1951, noting "Such service was begun . . . with 56-passenger DC-4 planes."

► **Summer, 1951** CAB informally agreed United to start transcontinental coach service (American and TWA had been serving the route for years).

► **Sept. 23, 1952** United starts transcontinental 66-passenger DC-4 service to San Francisco.

► **Nov. 7, 1951** CAB, in closed door conference with major airline chiefs, says industry to expand coach service and end coach fares.

► **Dec. 5, 1952** United president Patterson announces transcontinental coach fare cut to lower seated rate and states: "Now it appears time to determine whether a scheduled airline can not fare better as well as reduce rates those who feel that we must besides our market with a second-class service. We will watch the experience closely and see if we can either expand or expand the lowest fare service, depending on our economic results."

► **Dec. 6, 1951** CAB issues policy statement urging airlines to expand coach service and cut fares, the same message discussed with the industry informally the week before. Effect sets maximum seating densities (including 64-seat DC-4 and 56-seat DC-6) for the coach service, to ensure profitability for the 44-seat rate—25% under flat class.

► **May 7, 1953** Patterson, in annual report to stockholders, states: "Lowered coach fares serve still more to consider economy rather than safety."

The extent of the coach market and the problem of diversion from standard fare income continue to be greatest assignable costs after a more extended period of scheduled operation. It also must be recognized that approach requires that for his take place under abnormal traffic conditions occasioned by the national emergency and that it costs to date cannot be considered as indicative of those which would obtain under more normal conditions."

► **May 1, 1952** Trans-Atlantic coach starts, with average traffic volume of 50% attributed to coach route.

► **September-October, 1952** Major transoceanic airports via coach rapid pace plus product strength will

comprise 16 seats 54-seat DC-4 coaches used to convert to 37-seats (16) to seats under regular cabin. This is to give more room and forward cabin bedroom and creating a extra seat there.

► **Jan. 6, 1953** CAB denies United permission to ground it is transoceanic and may be under competition Board gives United until Jan. 16 to accede CAB coach policy with that of CAB seat next of the routes. Board suggests Patterson use a 64-seat DC-6, which is big enough to meet both Patterson's new safety criteria and the Board's one year coach policy.

► **Jan. 7, 1953** Patterson sends telegram to CAB administrator saying that "United Air Lines plans to continue to operate its transoceanic routes with the largest seating capacity," and proposing a nonvoluntary adjustment of the current safety seat.

► **Jan. 8, 1953** Eddie Patterson demands a transcontinental coach certificate a year ago, requests CAB exception to give coach service as United's rights to provide transoceanic service is denied in the safety testimony and public statements which United has over a period of years, presented.

► **Jan. 8, 1953** United files a special exemption. United also saw itself propose CAB approval within 24 hr. of the same 54-seat coach.

► **Jan. 9, 1953** United gets the United ticket, the last United operates a transcontinental flight of 44-seat flat class, which equates a 64-seat configuration for DC-6 coach service.

► **Jan. 9, 1953** United announces plan to switch gradually from DC-4 to DC-6 coach seats starting May 1 at about 70 passenger capacity, which it in connection with CAB policy. This plan used to write the dispute eventually but the cost remained as to whether Patterson could change coach fare on what CAB considers flat-class DC-4 seating between now and the time the last 54-seat or 64-seat United DC-6 coach is required to fly.

► **Jan. 12, 1953** Patterson places full page ad in leading journals, explaining his decision to fight CAB policy regarding high density seating for low coach fare. United has a "moral obligation" to serve our patrons with safety that we consider stringent." Patterson concludes in his ad.

► **Jan. 16, 1953** American Airlines openly backs CAB in its fight with United by supporting application to the Board for permission to fight back coach service as "modern safety" to United's transcontinental routes from the East via Chicago to San Francisco and Oakland.

► **Jan. 16, 1953** Patterson fails to get permission and the other two will fight CAB instead of CAB instead of 64 seats.



IDEAS PAY OFF

Paul Freeman (left), marketing manager for Continental Air Lines, Denver, and a Chicago magazine commentator, receives a batch of six tickets bearing \$359 from Eddie Patterson (right) prior to the start of the CAB听证会. The CAB estimated the amount of the awards by multiplying by 10% the calculated savings in dollars the idea will achieve.



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AIRLINE EXECUTIVES sign Idlewild leases. Gov. Dewey (third from right) watches.

Airlines Sign Idlewild Leases

Tenant: 25 year lease for the east of Elmhurst International Airport, N. Y. was signed Jan. 8 by representatives of all leading airlines and the Port of New York authority, occupants of the giant 4,900-acre terminal.

The lease, with exhibits and maps, filled 384 pages, concluding with the 10-page, \$100,000 addendum. "Dewey Agreement," signed Aug. 5, 1949, follows a fact, 25 year tenancy called by the New York power to end a complicated dispute between the carriers and PANYA over use of the air terminal.

Signers were: C. R. Smith, president American Airlines; E. F. Stratemeyer, North American manager; British Overseas Airways Corp.; Capt. E. V. Rademaker, president Eastern Air Lines; John L. Morris, vice president National Airlines; Hon. H. Ferry, president Northeast Airlines; James T. Tripp, president Pan American World Airways; S. B. Timan, president Trans World Airlines, and Carter Burden, vice president transoceanic projects United Air Lines. Executive director Arthur J. Tamm signed the agreement for the Port of New York.

► Foreign Airlines—A number of foreign carriers did not participate at the signing Jan. 5 since the terms were still being studied by their home offices and governments at that date. These included Aeroflot (Russia), Pan Am, Air France, Israel National Airlines, KLM Royal Dutch Airlines, Lufthansa, Aeropostal Venezuela (L.A.), Loftleidir Icelandic Airlines, Belgian Airlines (Solvay), Scandinavian Airlines System (SAS), Swissair and Trans-Canada Air Lines (TCA).

The new leases have principles laid down as the earlier document, reinforced by Gov. Dewey and the Port of New York. The original lease, Sept. 30, 1948, provided for a rent of 17.44 cents per sq. ft. of aircraft weight for the period ending June 30, 1953. Rent is a 10% increase

on a formula computed upon costs of operation and the aircraft load. Details will be released to the American Arbitration Association.

PANYA is obligated to construct \$11 million in hangar facilities for the carriers if demanded as writing on or before Dec. 31, 1953. Most of this obligation may increase under the Dewey agreement, but \$13 million appears 55 million worth of hangar facilities for Trans World Airlines and 35 million in similar construction for United Air Lines.

► Gov. Dewey Once Usurps—Such facilities will be rented by the carriers for a 25-year period, with the carrier making a 10% down payment on construction cost and rental for the period totaling 10% of construction and interest cost.

Airlines can build their own facilities with approval of the Authority, raising the space at \$1,000 per acre per year.

PANYA also is obligated to provide gasoline storage and aviation lubrication at a flat rate of \$4.40 cents per gallon for delivery of the former and \$4.40 per gallon for delivery of the latter through a contract "at a reasonable rate per gallon." Previews must be made for storage of a 10-day supply of aviation fuel at all airline leases. It is expected that press storage will be adequate until 1956. During the peak, storage in 1952, aviation fuel consumption was estimated at 5.3 million gals. monthly.

The Idlewild terminal to date represents an expenditure of more than \$110 million by the City of New York and the Authority, with the latter having spent or committed some \$50 million. The field was leased from the city June 1, 1945, and is used by 12 U. S. Air and 13 foreign carriers. Last year there were more than 1,000,000 passengers, mostly transients, at Idlewild and more than 2,250,000 passengers, 500 million pounds of cargo and 15 million pounds of air mail were handled.

New German Airline Bidding for Convair

A new German airline is being organized with Consolidated Value for Dr. Claus Lauer, 54, but so far has been unable to finance the estimated \$3.5-million purchase, a Convair official reported.

The new Luftkraften is now seeking to be negotiating with the Export-Import Bank for a loan, but the bank and bank trust that the radiator had not made an application.

Reports from Cologne and the new Luftkraften has as initial capital of six million marks (approximately \$1.5 million).

The present organization will comprise the nucleus of an airline that will be headquartered in the neighborhood of 150 million marks and will operate a dozen twin-engine planes and the same number of four-engine planes. The chief executive officer is Dr. Klaus Reichenbach, who was West German states and private capital will finance.

Plans have been prepared by the West German Transport Ministry for seven to the northeast European capitals and the U. S. South America, the Middle and Near East, and Africa. There are hopes that the carrier will be competitive with the 38 flights a week now operating on German and these can apparently be 140 offices early established in West Germany and spread about 90 million marks there.

Aerial Spraying Set For Canadian Forest

Central Aircraft, Inc., recently began a research to spray trees that a radiation doses of forest to control Gypsy moths, possibly the largest single aerial spraying project in history.

The Yakima, Wash., flying firm and at least 75 planes will spray later this summer gallons of insecticides in an effort to wipe out spruce budworm in British Columbia in New Brunswick.

Several hundred thousand gallons of oil and insecticides will be sprayed in selected areas as needed, checked and checked out as needed.

The contract was awarded to Central Aircraft in Forest Protection, Ltd., an organization formed by several pulp and paper companies, the Province of New Brunswick, and the Canadian government.

What's a DC-3 Worth?

The question of how much a DC-3 is worth has been the subject of debate between the Boeing Aerospace Company and Trans-Canada Air Lines. TCA says its five DC-3 planes are worth from \$65,000 to \$80,000 each. The carrier

said that Pan Am Air Lines recently sold 11 of the planes at \$63,000 each.

TCA is appealing TPA's prospective passenger rates, to take a one-percentage point cut in security for \$47,000. TPA allegedly owes the corporation an back fee.

Jet Boosters Fitted To SO 30 Bretagne

Two sets are being made with a French SO 34P Mk. I Bretagne two-stage ramjet aircraft with two Dornier Pulse jets, each at 10,000 rpm to improve performance capabilities. The easier Air Maroc has ordered the modification installed on its six Mk. I Bretagnes.

By ordering this power-booster feature, the carrier will save money compared with buying more powerful piston engines to replace the types now fitted. The Mk. I Bretagne has war-surplus Pratt & Whitney R-1830-CA-18 engines, which originally were in piston seaplanes. A Mk. I Bretagne has been developed fitted with more powerful, post-war R-1830-CA-18 engines. Like these engines are more difficult to obtain and more expensive with lower prices.

Fitting the Pulse military jets to the Mk. I Bretagne will permit increasing maximum payload by approximately 2,100 lb.



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C-46 Fire Safety, Power Updated

Operations of C-46 aircraft are awaiting results of final flight tests that month on a new engine nacelle cooling and fire-protection installation that may start the widespread transport of aircraft in need of such and projected for January.

Aerospace Associates, Miami, soon plans the installation but month and begin flight tests in conjunction with the operator's Aircraft Engineering Foundation, Air Force, Civil Aeromaritime Board and Civil Aeromaritime Administration. Completion of the 30-hour

flight test program is scheduled for the end of this month.

Another CAA modification test under way is the installation of fire retardant insulation that must start the widespread transport of aircraft in need of such and projected for January.

Engines Power Boost—II the series goes well. Aerospace plans to install a new CR 16 version of the Pratt & Whitney R-2800 engine with 480 hp more than



NEW FIREWALL of stainless steel is designed to protect C-46 engine accessories.

the present World War II version now operated in C-46s. Pratt & Whitney is shipping a mockup of the CR 16 to Aerospace, and plans to send two complete installations for flight test by July. Aerospace says the C-46 operators expect the engines to give the C-46 a like performance to the present C-46s and Marauder, with equal safety.

Norman H. Golden, American Aircraft's automotive engineer and project officer on the C-46 program, estimates operators' cost of the individual parts of the program as follows:

- Nacelle cooling and fire protection, \$30,000 per plane. This includes moving cowling flaps forward and increasing their area to improve cooling and protect the wheel well from fire, installing shrouds and shrouds between the propeller and engine section, and installation of three Ebersen fire detector cartridges—one for each nacelle.
- CR 16 Engine. Cost is estimated at \$70,000 or \$15,000 per engine, including avionics.

- Modification of cowling to handle more powerful engines will cost nearly \$35,000 more per plane, Golden says. This includes storage baffle and radiator tube, new engine instruments and a modernized cockpit layout along the lines of the new Result Aviation modification, featuring recommendations of the Society of Automotive Engineers cockpit standardization rule.

- Fire Protection—The new cowling is deemed not only to improve cooling but also to divert air (cogent for hot) off the engine section. The nacelle is expected to house the fire outside the plane instead of allowing it to burn through into the aircraft section. In the Newark C-46 crash a year ago, the bottom No. 10 cellular fire cut, and fire burned through the cowling and up into the aircraft section through the wheel well.

The specific modifications, CR 16 en-



NEW C-46 NACELLE is inspected by CAA's Rya, left, and chief pilot George.

gine installation and flight test are financed jointly by Aerospace and the Aircraft Engineering Foundation, headed by selected C-46 operators to take over the overall function of the aircraft manufacturer in improving aircraft. This function was disbanded in the case of the C-46 when the Curtiss-Wright Augustine Division went out of business.

CAB is encouraging these attempts of the C-46 operators to improve the safety and performance of the plane. Board Chairman Donald Ryan and controller Joseph Adlun have visited the American C-46 modification project in Miami. Robert Garrett, chief CAB pilot, planned last week to return to Miami to continue his participation in the flight test program.

- Safety Chief Adlun—improved safety and reliability set the chief aim of the CAB's C-46 modification program. CAB cut the time of this group of C-46 passenger flights from 16,000 to 45,000. It is a comparable figure higher than the original 42,500 proposed by the Board. The modification, now in flight test is expected to meet CAB safety criteria at the 45,000 ft gross weight.

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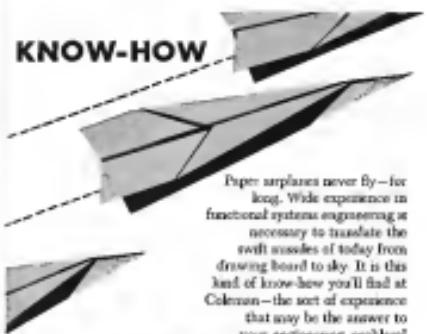


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SHORTLINES

materials priority to build a \$3,810,000
new building.

- Allegheny Airlines, formerly All-American Airways Inc., has G&R permission to split off its ranch and oil, All-American Engineering Co. Allegheny president Robert M. Love will retain his 1955 ownership at half fare, provided the company report transactions between such sister and with Love in 1955 and 1956. Charles W. Woolrich, former All-American vice-president, is the new president of the

- American Airlines plans daily nonstop transoceanic service starting April 26 from Los Angeles to Honolulu, Calif., to New York via Chicago. American has not served Hawaii since 1944, but the carrier says residents of the area (including Los Angeles County) still are treated to a greater degree than is true at other airports of Los Angeles.

- British European Airways reports 1972 traffic gained 17% compared with 1971 to 357 million passenger miles without a fatality. Freight gained 16% to 14,000 tons.

- **Barbers Air Lines** had the first week of January as the best in company history, with passenger revenues of \$3 million. Total Christmas New Year traffic was 185% more than 1951-52.
 - **Scandinavian Airlines System** has not yet received a definite date from the State Department for negotiation of SAS' request for a direct transoceanic connection.

- Japan's Diet has ratified a U.S. bilateral agreement and approved Japanese civil administrative authorities to grant foreign status Applications of Asia, At-Large, Japan International World Affairs and other carriers for trans-Pacific routes have not yet been acted upon
 - Swissair, English cross Channel operator, flew slightly more than 1 million flight miles in 1973, and its new Bristol Freightliner made more than 9,000 route loadings and takeoffs The carrier's Air Ferry Division

- * International Air Transport Assn.'s proposal of a slight 7% increase in travel agents' base coach and first-class tickets if delivered transoceanically by a CAB or its equivalent of other governments' air service policies.

- KLM Royal Dutch Airlines** says it will put Super Constellations on trans-Atlantic service as the airline has delayed this year using 90 standard and 82 coach Transoceanic Air Liners from Martin 2-8-2 seating, 40 passengers. SWA is the second local service airline to buy bigger passenger transports to replace DC-9s. First was Pan Am.

- Lake Central Airlines' temporary certificate has been renewed by CAA to Dec. 31, 1954. The Board also proposed an extension of Lake Central's certificate to Dec. 31, 1953, and approved the company's management plan, a variance agreement.
 - State Department and CAA expect early settlement of bilateral agreements with Venezuela allowing Pan American and Panagra New York-Caracas service and autorizing CAA to extend Maracaibo service.

- * Lambert-St. Louis Airport has DPA. * From: Western Airlines plans to begin service to Colombo, Ceylon, Feb 1.

WHAT'S NEW

New Books

Standard Aircraft Handbook by State Lovell and Stanley Rogers, 168 pages, profusely illustrated, published by Avia Publishers, Inc., 2342 Sunset Blvd., Los Angeles 26, Calif.

A data-packed pocket containing volume on stressed methods and procedures used by aircraft fabricators and assembly line workers. Hundreds of AM and NAS standards are listed and illustrated.

More than a quarter-million copies of the author's previous works have been sold. In compiling this book, they enlisted the aid of 25 top U.S. manufacturers and suppliers. It is aimed particularly at the new aircraft worker.

Telling the Market

Meditrac fixed ratio speed changes in two different series, one for auto-locking applications, are detailed in Bulletin 104 (unsealed), which can be obtained from Mettler Instrument Co., 412 Lincoln St., Denver 9, Colo.

Standard use of temperature-humidity test chamber, capable of simulating conditions from -10°F to +200°F and relative humidities from 20 to 95%, as described in Bulletin TBR-1, Weller Testers Engineering Inc., 24 Rue B. Noiret, N. Y.

Universal Metal Products, Inc., has
prepared an illustrated brochure for
garage construction and other forms

designed to assist in production methods for before welded parts or continuous arc welding of stainless steel and lightweight aluminum. Write the firm.

In case of Major Miller, sales manager,
2111 W. Orange St., Alhambra, Calif.

Heavy duty universal joints for aircraft and industrial applications are detailed in Catalog 27 available from Apex Machine & Tool Co., 1015 South Patterson Blvd., Division 2, Ohio.

Accessory equipment for aircraft powerplants is detailed in four bulletins available from General Electric, GEA-515, Accessory Turbine for Jet Aircraft; GEA-516, An Turbine Drive for Jet Aircraft; GEA-531, Accessory Alternator Fuel Pump; and GEA-5872, Aircraft Gas Turbine Stationary Power General Electric Co., Schenectady, N. Y.

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FLIGHT REFUELING INC. BIRMINGHAM, CALIF.

EDITORIAL

CAL's Air Rights Pay Off

Those airline executives alert enough to peer ahead and apply the lessons of the past to the problems of tomorrow, seem to be the chief discoverers of new virtue in commercial air transportation.

Too often the spotlight of publicity and appreciation pins on the big carriers, to the exclusion of important developments being made elsewhere in the industry.

There is Continental Air Lines, for example. There was a time when President Robert S. Crandall caused some Wall St. heads to shake firmly as the Houston entrepreneur contemplated the sparse population of these ten states, and wondered about Continental's long term growth possibility.

But Mr. S. kept a close watch on developments which he decided there was a shortcut to the alternative of working for Colorado, New Mexico, Kansas, Texas and the rest of his little empire to gain another 30 million population. And the shortcut wouldn't be at the expense of his present air forces. It would give them better service than ever.

The shortcut was to negotiate an interchange with American Airlines, which Civil Aeronautics Board granted. Now you see Continental's Convair in the of Los Angeles and American DC-6s in Continental strongholds such as San Antonio and Houston, operating on Continental schedules.

The happily surprised financial barons of Lower Manhattan have stopped shaking their heads so vigorously, as they realize that the traveling populations of the Midwest Six Empire have been pried off CAL routes by infiltration of other tassels from more densely populated areas.

In one recent fiscal period, Mr. S. reveals, the profit from this one American-Continental interchange route represented almost half of Continental's total profit.

When CAB approves a similar arrangement with United Air Lines for Seattle service, the imaginative Mr. S. thinks his strategic position at the hub of the nation's airways will really begin paying off.

Furthermore, he is not overlooking the international possibilities of interchange, and has already initiated overtures to American for operating his Convair 340s, on a conventional lease arrangement, from Denver to Mexico City through El Paso and Monterrey.

Mr. S. has not yet at the writing will deplored his territory's sparse population and mounting costs of serving it. He has been ingenious enough to find a way to harvest more revenue by serving more people with better air transportation.

Mr. S. doesn't fight progress, he makes it.

—Robert H. Wood



Robert S. Crandall

'Nobody Takes Things Off'

I would . . . sign all design engineers, and . . . all aircraft manufacturers, to be on the offensive in the interest of simplicity.

It is apparent that there are many more people who want to add things to airplanes than to take them off. Starting with the president and board of directors, and proceeding on down through the sales and public relations department, the operations department, the parts, procurement and maintenance departments, and the other engineers and management staff, there is a continuous development of good ideas, each regarding the addition of more added complexity, unless such complexity has definitely compensatory and short-cutting qualities.

No one apparently is devoted to taking things off. The ultimate effects on weight, economy and safety we evaluate.

(From the Wright Brothers letter to 1952, in *William Lindstrand, our president-engineer*, American Author)

Making the Most of Business Planes

Growth of utility aircraft operations has been the brightest spot in the present aviation picture since the end of the war. Millions of dollars are spent every year on executive and business planes, but we learn with surprise from Robert M. Hewitt that most owners achieve much less than maximum use and value from this vital fleet, now estimated at 4,500 to 9,500 aircraft.

Mr. Hewitt, who has made a reputation in buying, selling, converting and servicing executive and business planes, has made suggestions to scores of plane owners that have improved markedly utilization of aircraft, and thus cut overhead, hourly flying costs, and increased the value of these aids and business tools to their owners.

It probably is accurate to say that companies which have worked out efficient scheduling and usage of their planes are still in the minority. Only recently, for example, has General Motors Corp. centralized its flight services for the 20 odd planes it then

One reason for poor utilization, of course, is simple lack of thought and planning. There also is the philosophy held by the president or top executives or many plane-owning firms that the company plane is a toy, to be reserved for the exclusive use of the president or a very few other high officials, to be held ready—and thus risks—“just in case.” Other firms never use one of these aircraft by more executives throughout their companies.

Mr. Hewitt believes that if the excess profits tax law is allowed to expire next June, companies owning aircraft will be glad they have strained and kept high utilization of these planes, and will value detailed records of flight operations, and the purposes and profits from these trips. These firms, when tax time comes, will have the necessary information about their aircraft's utilization in terms of time and money saved or profit made thereby.

Such companies, he says, will have no doubt about the dollar and cents value of their own aircraft, and neither will the Bureau of Internal Revenue.

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Cut assembly costs by using Rollpins as set screws, positioning dowels, clevis or hinge pins. Specify them in place of straight, serrated, tapered or cotter type pins.



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